SECTION THREE

GAME WIRING AND SCHEMATICS

CONNECTOR & COMPONENT IDENTIFICATION

Each plug or jack receives a number that identifies the circuit board and the position on that board that it connects to. J-designations refer to a male connector. P-designations refer to a female connector. For example, J101 designates jack 1 of board 1 (a Power Driver board jack); P206 designates plug 6 of board 2 (a CPU board plug). Identifying the specific pin number of a connector involves a hyphen, which separates the pin number from the plug or jack designation. For example, J101-3 refers to pin 3 of jack 1 on board 1.

Other game components may also have similar numbers to clarify their locations or related circuits. For example, F501 is a fuse on the Audio Video board.

Prefix numbers for WPC circuit boards are listed below.
J1XX - Power Driver board jacks; F1XX - Power Driver board fuses
J2XX - CPU Board (There are no fuses on the CPU board.)
J5XX and J6XX - Audio Video board (AV board) jacks; F5XX and F6XX - Audio Video board fuses

Schematics for standard WPC backbox boards are found in the WPC Schematics Manual. Playfield, cabinet and all other backbox board schematics are found in this section.

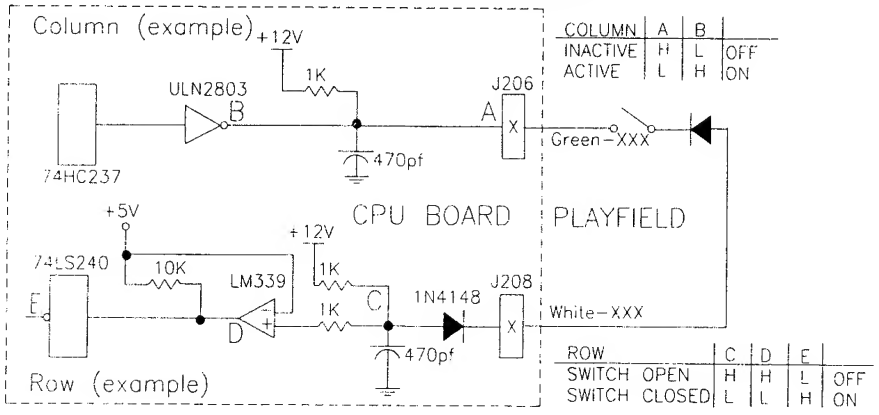
SWITCH MATRIX

White ——▶|—o o— Green

Dedicated Grounded Switches	Column / Row	1 Green-Brown J206-1 U20-18	2 Green-Red J206-2 U20-17	3 Green-Orange J206-3 U20-16	4 Green-White J206-4 U20-15	5 Green-Black J206-5 U20-14	6 Green-Blue J206-6 U20-13	7 Green-Violet J206-7 U20-12	8 Green-Gray J206-9 U20-11	Flipper Grounded Switches
Orange-Brown **J205-1** Left Coin Chute U17-5 D1	**1 White-Brown** J208-1 U18-11	LAUNCH BALL 11	SLAM TILT 21	TROUGH EJECT 31	MOAT ENTER 41	LEFT SLINGSHOT 51	LEFT RAMP ENTER 61	RIGHT BANK TOP 71	NOT USED 81	**Black-Green** **J208-13** Lower Right Flipper E.O.S. F1
Orange-Red **J205-2** Center Coin Chute U17-7 D2	**2 White-Red** J208-2 U18-9	CATAPULT TARGET 12	COIN DOOR CLOSED 22	TROUGH BALL 1 32	NOT USED 42	RIGHT SLINGSHOT 52	LEFT RAMP EXIT 62	RIGHT BANK MIDDLE 72	NOT USED 82	**Blue-Violet** **J212-12** Lower Right Flipper Opto F2
Orange-Black **J205-3** Right Coin Chute U17-11 D3	**3 White-Orange** J208-3 U18-5	START BUTTON 13	NOT USED 23	TROUGH BALL 2 33	NOT USED 43	LEFT JET BUMPER 53	RIGHT RAMP ENTER 63	RIGHT BANK BOTTOM 73	NOT USED 83	**Black-Blue** **J208-12** Lower Left Flipper E.O.S. F3
Orange-Yellow **J205-4** 4th Coin Chute U17-9 D4	**4 White-Yellow** J208-4 U18-7	PLUMB BOB TILT 14	ALWAYS CLOSED 24	TROUGH BALL 3 34	CASTLE LOCK 44	BOTTOM JET BUMPER 54	RIGHT RAMP EXIT 64	LEFT TROLL UP 74	NOT USED 84	**Blue-Gray** **J212-11** Lower Left Flipper Opto F4
Orange-Green **J205-6** U16-9 Normal Function: Test Function: **Srv Crdts** / **Escape** D5	**5 White-Green** J208-5 U19-11	LEFT TROLL TARGET 15	RIGHT TROLL TARGET 25	TROUGH BALL 4 35	LEFT TROLL (UNDER PLAYFIELD) 45	RIGHT JET BUMPER 55	LEFT LOOP LOW 65	RIGHT TROLL UP 75	NOT USED 85	**Black-Violet** **J208-11** Upper Right Flipper E.O.S. F5
Orange-Blue **J205-7** U16-11 Normal Function: Test Function: **Volume Dn** / **Down** D6	**6 White-Blue** U208-7 U19-9	LEFT OUTLANE 16	LEFT RETURN LANE 26	LEFT POPPER 36	RIGHT TROLL (UNDER PLAYFIELD) 46	DRAW-BRIDGE UP 56	LEFT LOOP HIGH 66	NOT USED 76	NOT USED 86	**Black-Yellow** **J212-10** Upper Right Flipper Opto F6
Orange-Violet **J205-8** U16-7 Normal Function: Test Function: **Volume Up** / **Up** D7	**7 White-Violet** J208-8 U19-5	RIGHT RETURN LANE 17	RIGHT OUTLANE 27	CASTLE GATE 37	LEFT TOP LANE 47	DRAW-BRIDGE DOWN 57	RIGHT LOOP LOW 67	NOT USED 77	NOT USED 87	**Black-Gray** **J208-10** Upper Left Flipper E.O.S. F7
Orange-Gray **J205-9** U16-5 Normal Function: Test Function: **Begin Test** / **Enter** D8	**8 White-Gray** J208-9 U19-7	SHOOTER LANE 18	RIGHT EJECT 28	CATAPULT 38	RIGHT TOP LANE 48	TOWER EXIT 58	RIGHT LOOP HIGH 68	NOT USED 78	NOT USED 88	**Black-Blue** **J212-9** Upper Left Flipper Opto F8

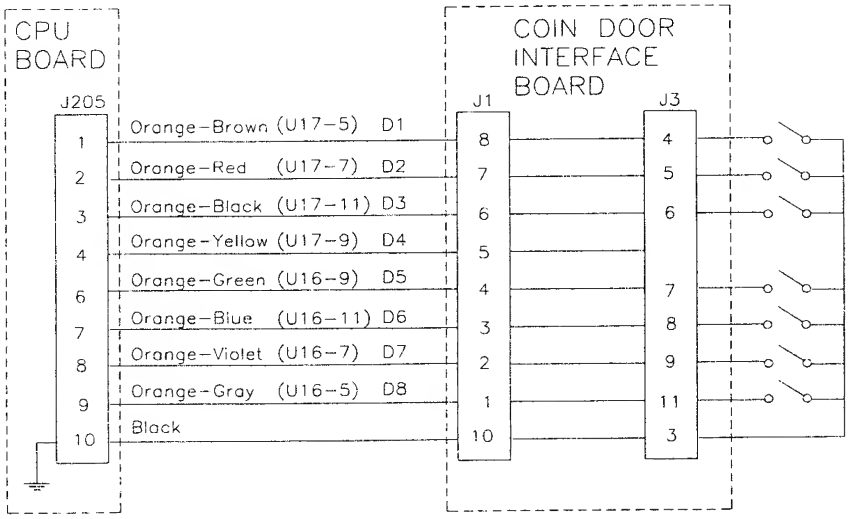
J2XX = CPU BOARD = OPTO, TYPICALLY CLOSED

SWITCH MATRIX CIRCUIT



The microprocessor is constantly strobing the column side of the switch. When point "A" on the column circuit toggles low, the column side is active. When a switch closes, the row side of the circuit activates. The "+" input to the LM339 drops below +5V, therefore, its output is low. Corresponding row and column switches must be low at the same time for the switch to be considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row is inactive.

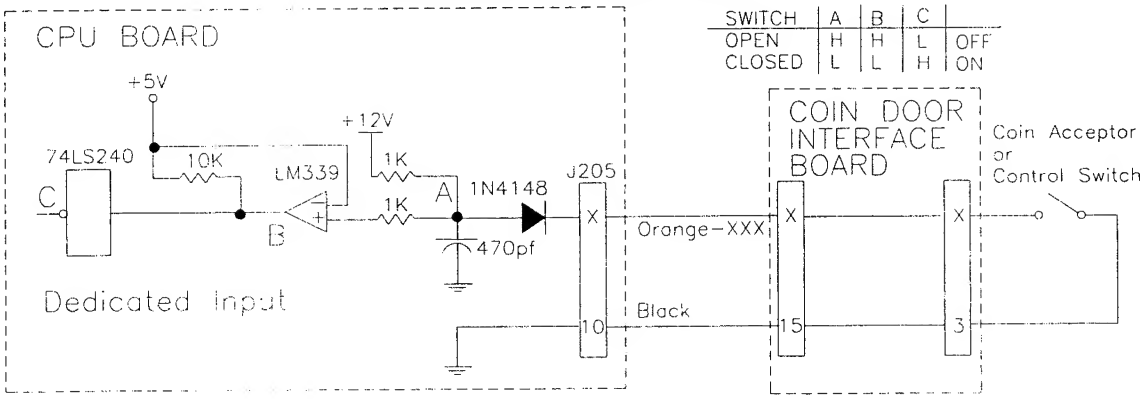
DEDICATED SWITCHES



Coin Acceptor Switches
D1 - Left Coin Chute
D2 - Center Coin Chute
D3 - Right Coin Chute
D4 - Fourth Coin Chute

Control Switches
D5 - Normal Function, Service Credits; Test Function, Escape
D6 - Normal Function, Volume Down; Test Function, Down
D7 - Normal Function, Volume Up; Test Function, Up
D8 - Normal Function, Begin Test; Test Function, Enter

DEDICATED SWITCH CIRCUIT



The dedicated switches operate similar in the matrix, except that instead of a column circuit there is a direct tie to ground. Therefore, the column side is constantly active (low).

When a switch closes, the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V, therefore the output is low. Since the row circuit (dedicated input) is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, it output is high and the row is inactive

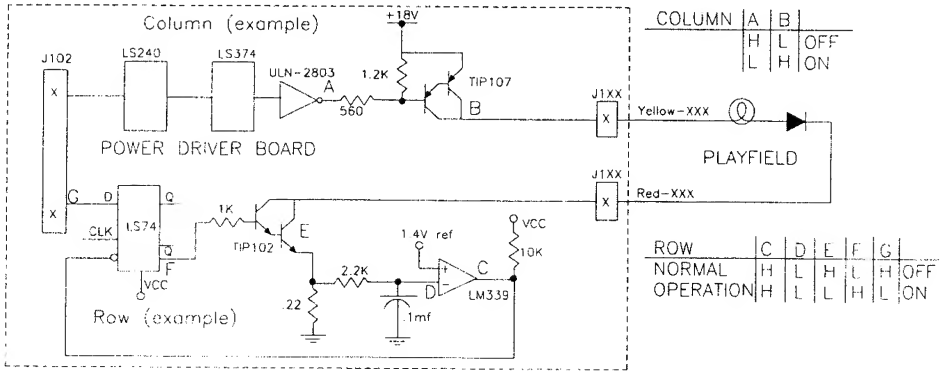
LAMP MATRIX

Yellow (B+) — Red

Column / Row	1 Yellow-Brown J121-1 Q96	2 Yellow-Red J121-2 Q100	3 Yellow-Orange J121-3 Q95	4 Yellow-Black J121-4 Q99	5 Yellow-Green J121-5 Q94	6 Yellow-Blue J121-6 Q98	7 Yellow-Violet J121-7 Q93	8 Yellow-Gray J121-9 Q97
1 Red-Brown J125-1 Q104	RIGHT BANK TOP 11	RIGHT LOOP JACKPOT 21	TROLLS! 31	LEFT LOOP JACKPOT 41	CENTER ARROW 51	FRANCOIS D'GRIMM 61	HOWARD HURTZ 71	RIGHT OUTLANE 81
2 Red-Black J125-2 Q108	RIGHT BANK MIDDLE 12	RIGHT JOUST VICTORY! 22	EXTRA BALL 32	LEFT JOUST VICTORY! 42	BATTLE FOR THE KINGDOM 52	KING OF PAYNE 62	MAGIC SHIELD 72	RIGHT RETURN 82
3 Red-Orange J125-4 Q103	RIGHT BANK BOTTOM 13	RIGHT CLASH! 23	MERLIN'S MAGIC 33	LEFT CLASH! 43	MASTER OF TROLLS 53	EARL OF EGO 63	SIR PSYCHO 73	LEFT RETURN 83
4 Red-Yellow J125-5 Q107	RIGHT RAMP JACKPOT 14	RIGHT CHARGE! 24	TROLL MADNESS 34	LEFT CHARGE! 44	DEFENDER OF DAMSELS 54	LEFT RAMP JACKPOT 64	DUKE OF BOURBON 74	LEFT OUTLANE 84
5 Red-Green J125-6 Q102	SAVE THE DAMSEL! (2) 15	PATRON OF THE PEASANTS 25	DAMSEL MADNESS 35	CATAPULT JACKPOT 45	LEFT TOP LANE 55	REVOLTING PEASANTS! 65	CASTLE LOCK 2 75	CASTLE LOCK 3 85
6 Red-Blue J125-7 Q106	DRAGON DEATH 16	CATAPULT ACE 26	PEASANT MADNESS 36	CATAPULT SLAM! 46	RIGHT TOP LANE 56	UGLY RIOT! 66	CASTLE LOCK 1 76	SHOOT AGAIN 86
7 Red-Violet J125-8 Q101	DRAGON SNACK 17	JOUST CHAMPION 27	CATAPULT MADNESS 37	BAM! 47	LEFT TROLL TARGET 57	ANGRY MOB! 67	SUPER JACKPOT 77	LAUNCH BUTTON 87
8 Red-Gray J125-9 Q105	DRAGON BREATH 18	CASTLE CRUSHER 28	JOUST MADNESS 38	WAM! 48	RIGHT TROLL TARGET 58	RABBLE ROUSER 68	SUPER JETS (2) 78	START BUTTON 88

J1XX = Power Driver Board

LAMP MATRIX CIRCUIT



The microprocessor sends a signal to the column circuit causing the output of the UNL-2803 to toggle. When point "A" drops low, the TIP107 transistor conducts and point "B" changes to a high state. At the same time, the microprocessor drives the input of the 74LS74 low, causing a high at output "F". A high state at the base of the TIP102 causes the transistor to conducts, bringing the row circuit to ground and turning the lamp on. The microprocessor changes the input of the 74LS74 to a high state to turn the lamp off. In overcurrent conditions, the lamp is shut off through the comparator. If the voltage at the negative input of the LM339 rises above 1.4V, the output changes to a low, which is fed back to the 74LS74 and shuts the circuit off.

SOLENOID/FLASHER TABLE

Sol. No.	Function	Solenoid Type	Voltage Connections			Drive Xistor	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Insert
01	AUTO PLUNGER	High Power	J133-2			Q72	J116-1			VIO-BRN	AE-23-800	
02	TROUGH EJECT	High Power	J133-2			Q68	J116-2			VIO-RED	AE-26-1500	
03	LEFT POPPER	High Power	J133-2			Q71	J116-4			VIO-ORG	AE-26-1200	
04	CASTLE	High Power	J133-2			Q67	J116-5			VIO-YEL	AE-26-1500	
05	CASTLE GATE POWER	High Power	J133-2			Q70	J116-6			VIO-GRN	A-20099	
06	CASTLE GATE HOLD	High Power				Q66	J116-7			VIO-BLU		
07	KNOCKER	High Power		J133-2		Q69		J116-8		VIO-BLK	AE-23-800	
08	CATAPULT	High Power	J133-2			Q65	J116-9			VIO-GRY	AL-23-800	
09	RIGHT EJECT	Low Power	J133-3			Q44	J113-1			BRN-BLK	AE-27-1200	
10	LEFT SLINGSHOT	Low Power	J133-3			Q48	J113-3			BRN-RED	AE-26-1200	
11	RIGHT SLINGSHOT	Low Power	J133-3			Q43	J113-4			BRN-ORG	AE-26-1200	
12	LEFT JET BUMPER	Low Power	J133-3			Q47	J113-5			BRN-YEL	AE-26-1200	
13	BOTTOM JET BUMPER	Low Power	J133-3			Q42	J113-6			BRN-GRN	AE-26-1200	
14	RIGHT JET BUMPER	Low Power	J133-3			Q46	J113-7			BRN-BLU	AE-26-1200	
15	TOWER DIVERTER PWR	Low Power	J133-3			Q41	J113-8			BRN-VIO	A-20099	
16	TOWER DIVERTER HOLD	Low Power				Q45	J113-9			BRN-GRY		
17	LEFT SIDE LOW FLSHRS	Flasher	J133-6	J134-5		Q28	J111-1	J112-1		BLK-BRN	#906 (1)	#906 (1)
18	LEFT RAMP FLASHERS	Flasher	J133-6	J134-5		Q32	J111-2	J112-2		BLK-RED	#89 (1)	#906 (1)
19	LEFT SIDE HIGH FLSHRS	Flasher	J133-6	J134-5		Q27	J111-3	J112-3		BLK-ORG	#906 (1)	#906 (1)
20	RIGHT SIDE HIGH FLSHRS	Flasher	J133-6	J134-5		Q31	J111-4	J112-4		BLK-YEL	#906 (1)	#906 (1)
21	RIGHT RAMP FLASHERS	Flasher	J133-6			Q26	J111-5			BLU-GRN	#906 (1), #89 (1)	
22	CASTLE RIGHT SIDE FLSHRS	Flasher	J133-6			Q30	J111-6			BLU-BLK	#906 (2)	
23	RIGHT SIDE LOW FLSHRS	Flasher	J133-6			Q25	J111-7			BLU-VIO	#906 (1), #89 (1)	
24	MOAT FLASHERS	Flasher	J133-6			Q29	J111-8			BLU-GRY	#89 (2)	
25	CASTLE LEFT SIDE FLSHRS	Gen. Purpose	J133-6			Q16	J109-1			BLU-BRN	#906 (2)	
26	*TOWER LOCK POST	Gen. Purpose	J133-1			Q15	J109-2			BLU-RED	AE-27-1200	
27	*RIGHT GATE	Gen. Purpose	J133-1			Q14	J109-3			BLU-ORG	A-14406	
28	*LEFT GATE	Gen. Purpose	J133-1			Q13	J109-4			BLU-YEL	A-14406	
	General Illumination											
01	BOTTOM PLAYFIELD	G.I.	J106-1	J105-1		Q5	J106-7	J105-7		WHT-BRN	#44	#555
02	MIDDLE PLAYFIELD	G.I.		J105-2		Q4		J105-8		WHT-ORG		#555
03	TOP PLAYFIELD	G.I.		J105-3		Q3		J105-9		WHT-YEL		#555
04	**TOP INSERT	G.I.	J106-5			Q2	J106-10			WHT-GRN	#44	
05	**BOTTOM INSERT	G.I.	J106-6		J104-3	Q1	J106-11		J104-1	WHT-VIO	#44	

	Flipper Circuits	Solenoid Type	Voltage Connection Playfield	Drive Xistors Power	Drive Xistors Hold	Drive Connections Playfield	Drive Wire Colors Power	Drive Wire Colors Hold	Coil Part No.	Coil Colors
29		Power	J119-1 (RED-GRN)	Q90		J120-13	YEL-GRN		FL-11629	BLUE
30	LOWER RIGHT FLIPPER	Hold	J119-1 (RED-GRN)		Q92	J120-11		ORG-GRN		
31		Power	J119-4 (RED-BLU)	Q87		J120-9	YEL-BLU		FL-11629	BLUE
32	LOWER LEFT FLIPPER	Hold	J119-4 (RED-BLU)		Q89	J120-7		ORG-BLU		
33		Power	J119-6 (RED-VIO)	Q84		J120-6	YEL-VIO		FL-11753	YELLOW
34	LEFT TROLL	Hold	J119-6 (RED-VIO)		Q86	J120-4		ORG-VIO		
35		Power	J119-8 (RED-GRY)	Q81		J120-3	YEL-GRY		FL-11753	YELLOW
36	RIGHT TROLL	Hold	J119-8 (RED-GRY)		Q83	J120-1		ORG-GRY		

	Motor Circuit	Solenoid Type	Voltage Connections Playfield	Drive Gates	Drive Connections Playfield	Drive Wire Color	Device Part Number Playfield
37	DRAWBRIDGE MOTOR	Low Power	J139-2	U3A, U3B	J110-1	BRN-WHT	14-8015

J1XX = POWER DRIVER BOARD

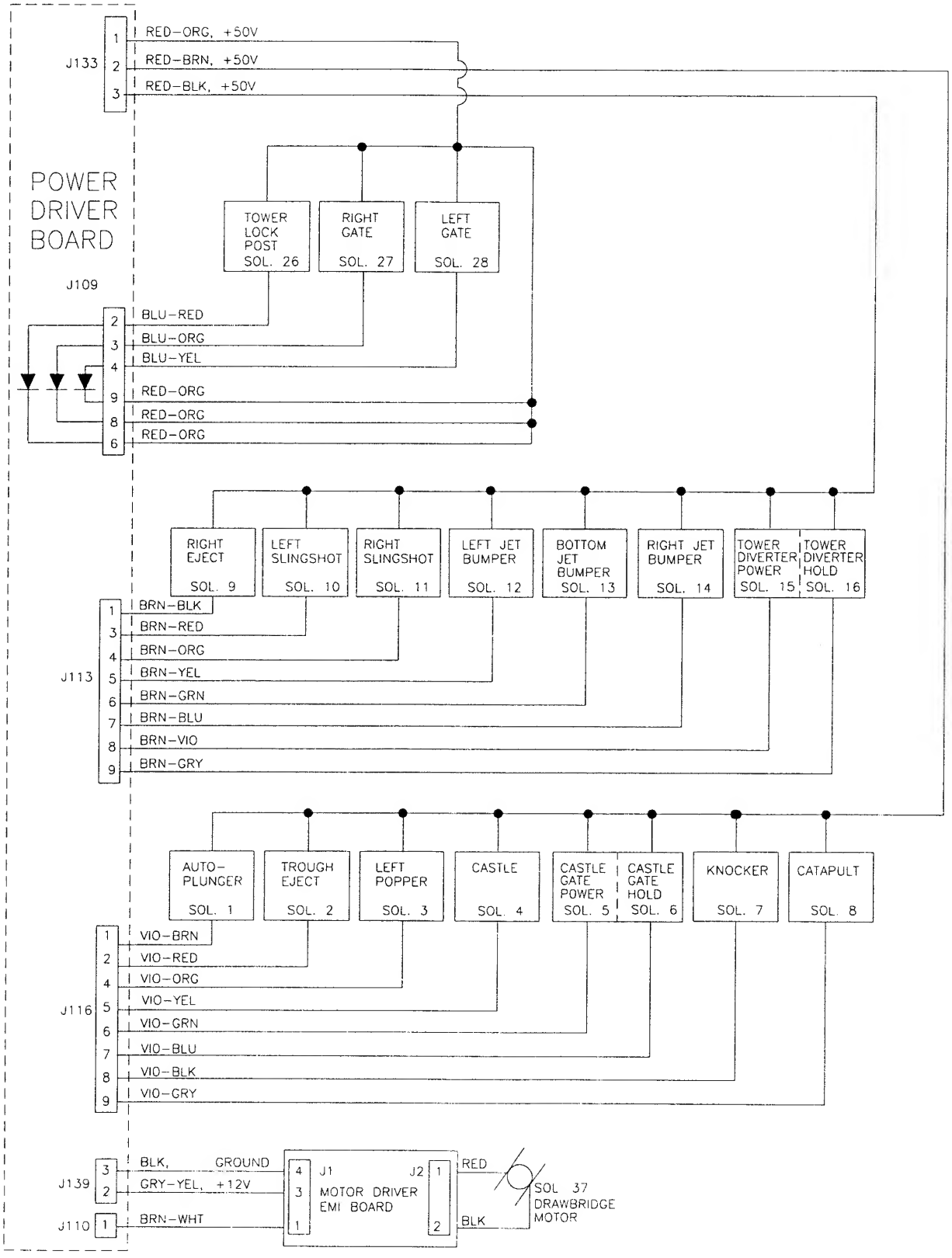
24-6549 = #44 BULB; 24-8704 = #89 BULB; 24-8768 = #555 BULB; 24-8802 = #906 BULB

*TIEBACK DIODES FOR SOLENOIDS 26 THROUGH 28 ARE AT J109-6, J109-8, AND J109-9 RESPECTIVELY.

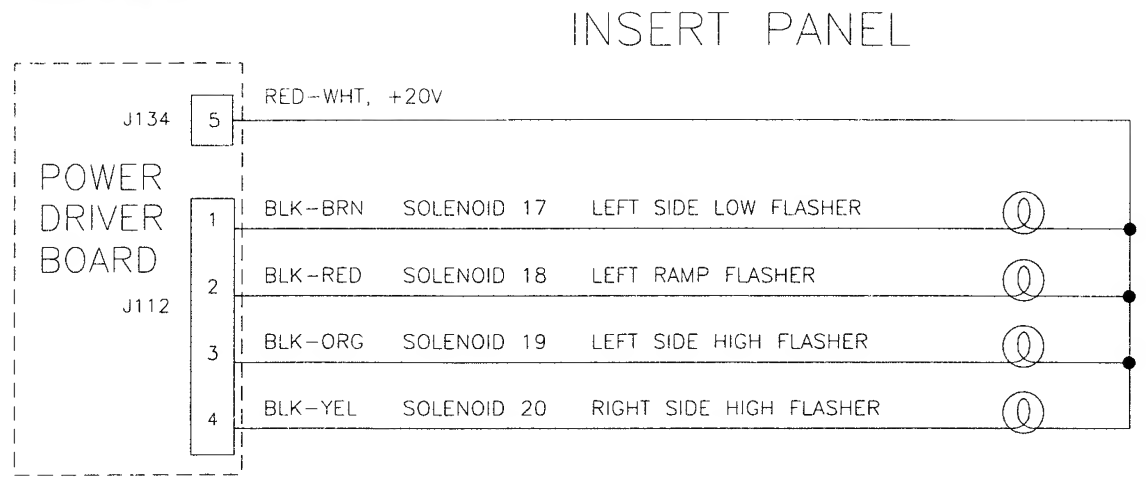
**THESE G.I. STRINGS DO NOT BRIGHTEN AND DIM, THEY ARE ALWAYS ON.

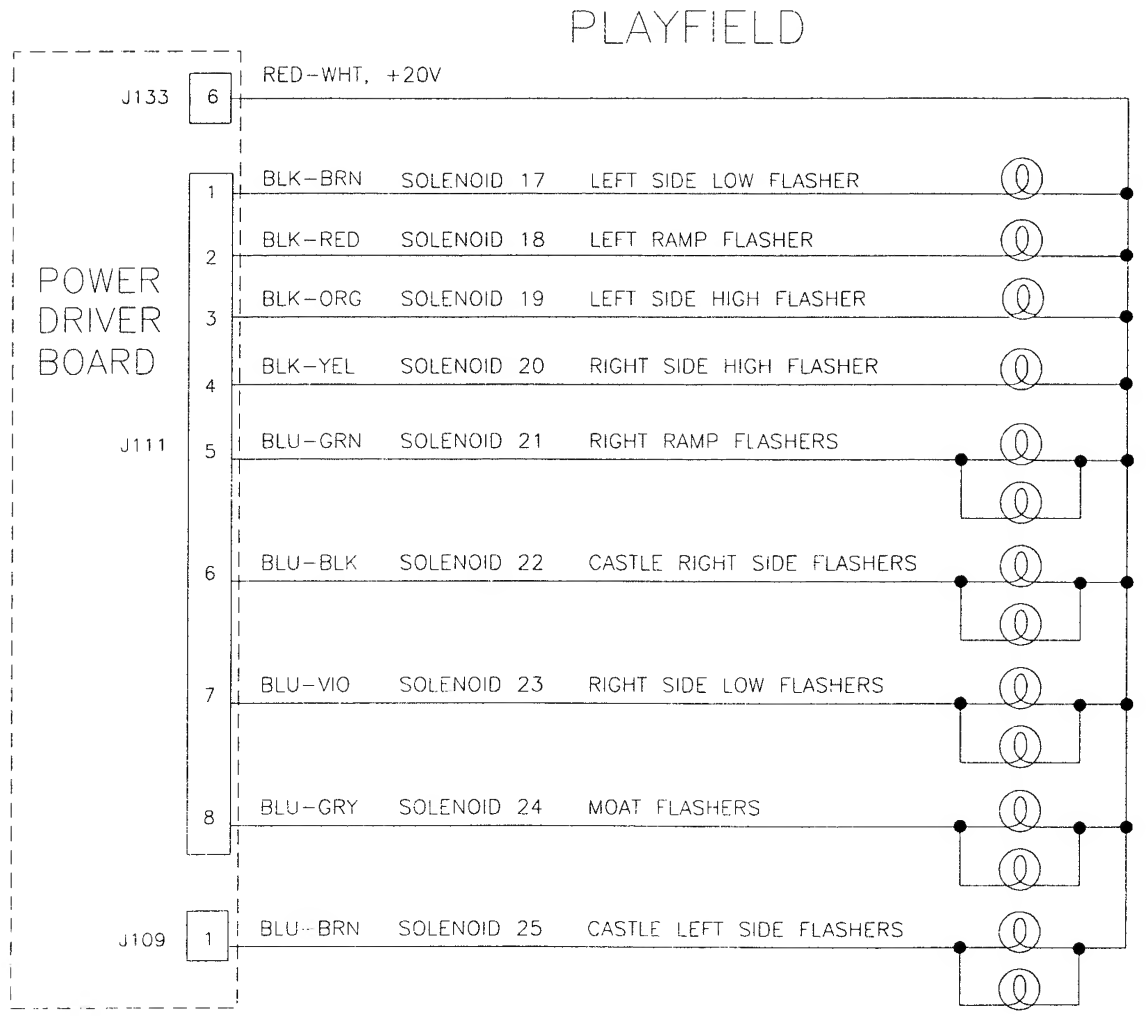
SOLENOID WIRING

COILS

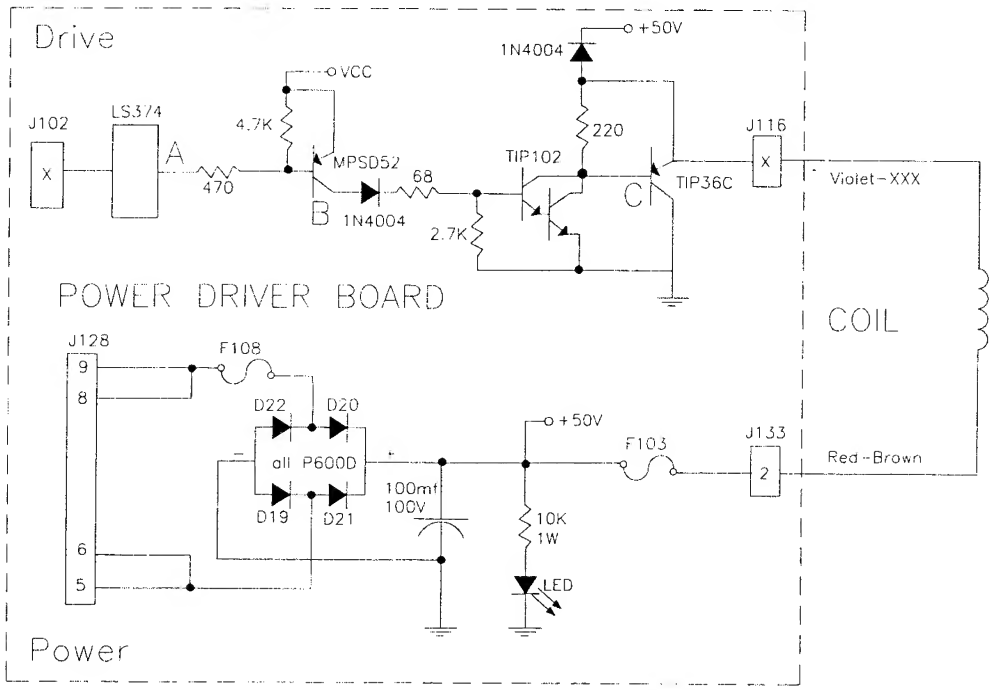


FLASHLAMPS


INSERT PANEL
POWER DRIVER BOARD
J112
J134
5
RED-WHT, +20V
1
BLK-BRN SOLENOID 17 LEFT SIDE LOW FLASHER
2
BLK-RED SOLENOID 18 LEFT RAMP FLASHER
3
BLK-ORG SOLENOID 19 LEFT SIDE HIGH FLASHER
4
BLK-YEL SOLENOID 20 RIGHT SIDE HIGH FLASHER

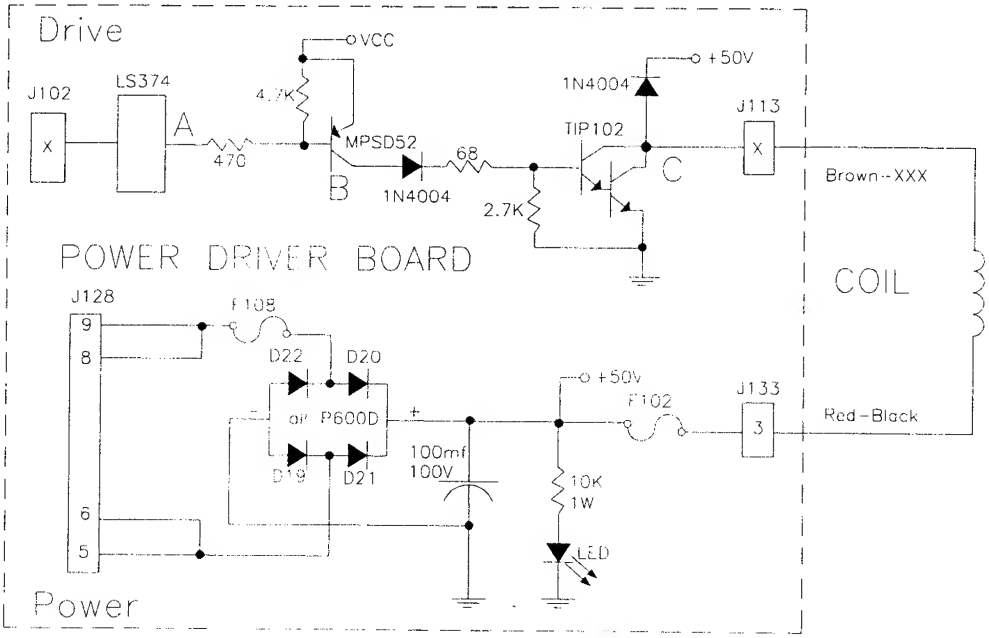

PLAYFIELD
POWER DRIVER BOARD
J133
6
RED-WHT, +20V
J111
1
BLK-BRN SOLENOID 17 LEFT SIDE LOW FLASHER
2
BLK-RED SOLENOID 18 LEFT RAMP FLASHER
3
BLK-ORG SOLENOID 19 LEFT SIDE HIGH FLASHER
4
BLK-YEL SOLENOID 20 RIGHT SIDE HIGH FLASHER
5
BLU-GRN SOLENOID 21 RIGHT RAMP FLASHERS
6
BLU-BLK SOLENOID 22 CASTLE RIGHT SIDE FLASHERS
7
BLU-VIO SOLENOID 23 RIGHT SIDE LOW FLASHERS
8
BLU-GRY SOLENOID 24 MOAT FLASHERS
J109
1
BLU-BRN SOLENOID 25 CASTLE LEFT SIDE FLASHERS

HIGH POWER SOLENOID CIRCUIT



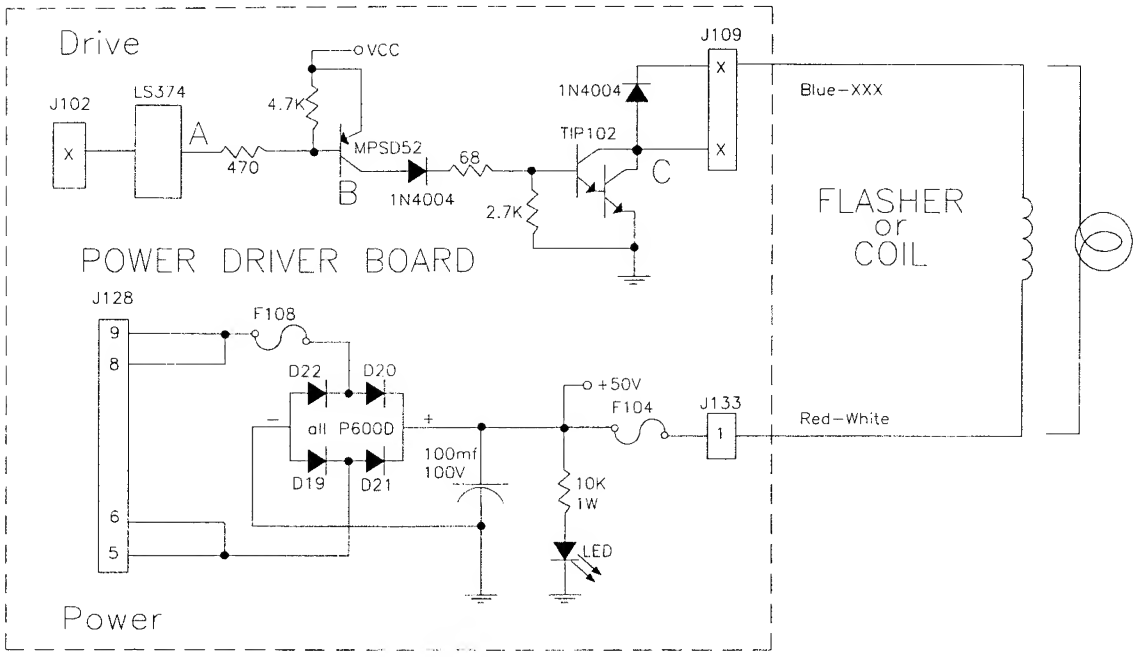
The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B", the collector of the 2N5401 transistor, is high. A high at point "B" causes point "C", the collector of the TIP102 transistor and point "D", the emitter of the TIP36C transistor, to drop low. When point "D" is low, the coil is grounded through the transistor and turns on. The coil shuts off when point "A" toggles high.

LOW POWER SOLENOID CIRCUIT



The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B", the collector of the 2N5401 transistor, is high. A high at point "B" turns on the TIP102 transistor and causes point "C" to drop low. When point "C" is low the coil is grounded through the transistor and turns on. The coil shuts off when point "A" toggles high.

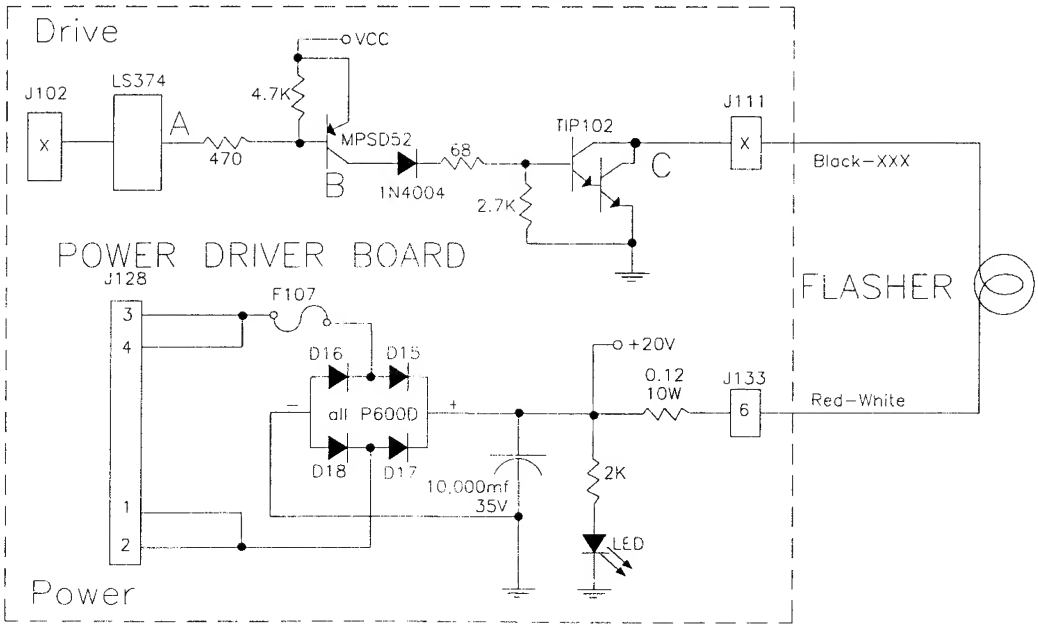
SPECIAL (GENERAL PURPOSE) SOLENOID CIRCUIT



The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor , is high. A high at point "B" causes a low at point "C". When point "C" is low, the coil/flashlamp is grounded through the transistor and turns on. When point "A" toggles high the coil/flashlamp turns off.

* Tieback diode is not used for flashlamp circuit.

FLASHLAMP CIRCUIT



The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor, is high. Once point "B" is high, point "C" the collector of the TIP102 transistor is low. When point "C" is low, the flashlamp is grounded through the transistor and turns on. When point "A" toggles high, the current shuts off.

GENERAL ILLUMINATION CIRCUIT

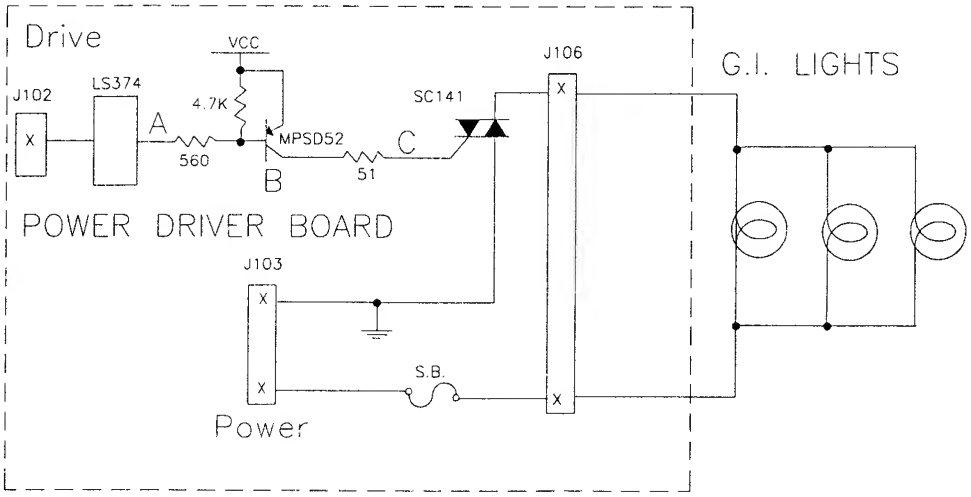


Figure #1

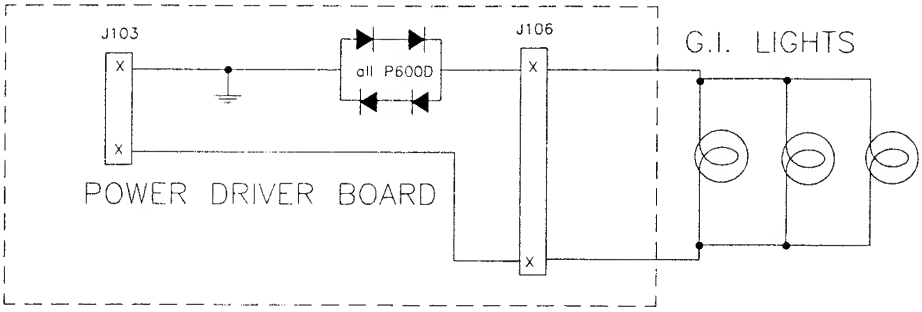
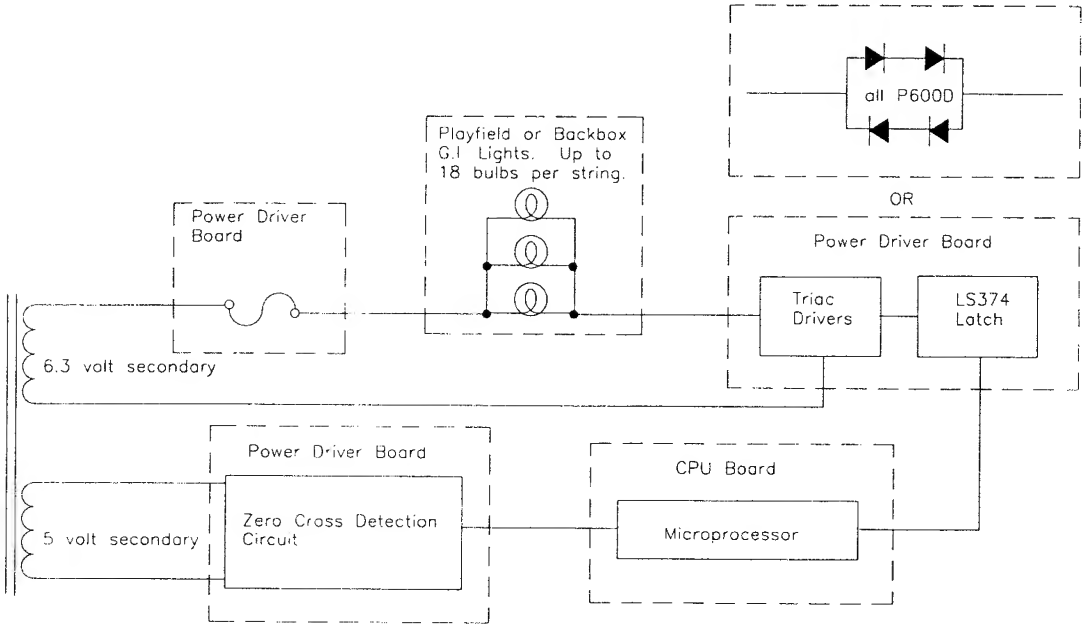


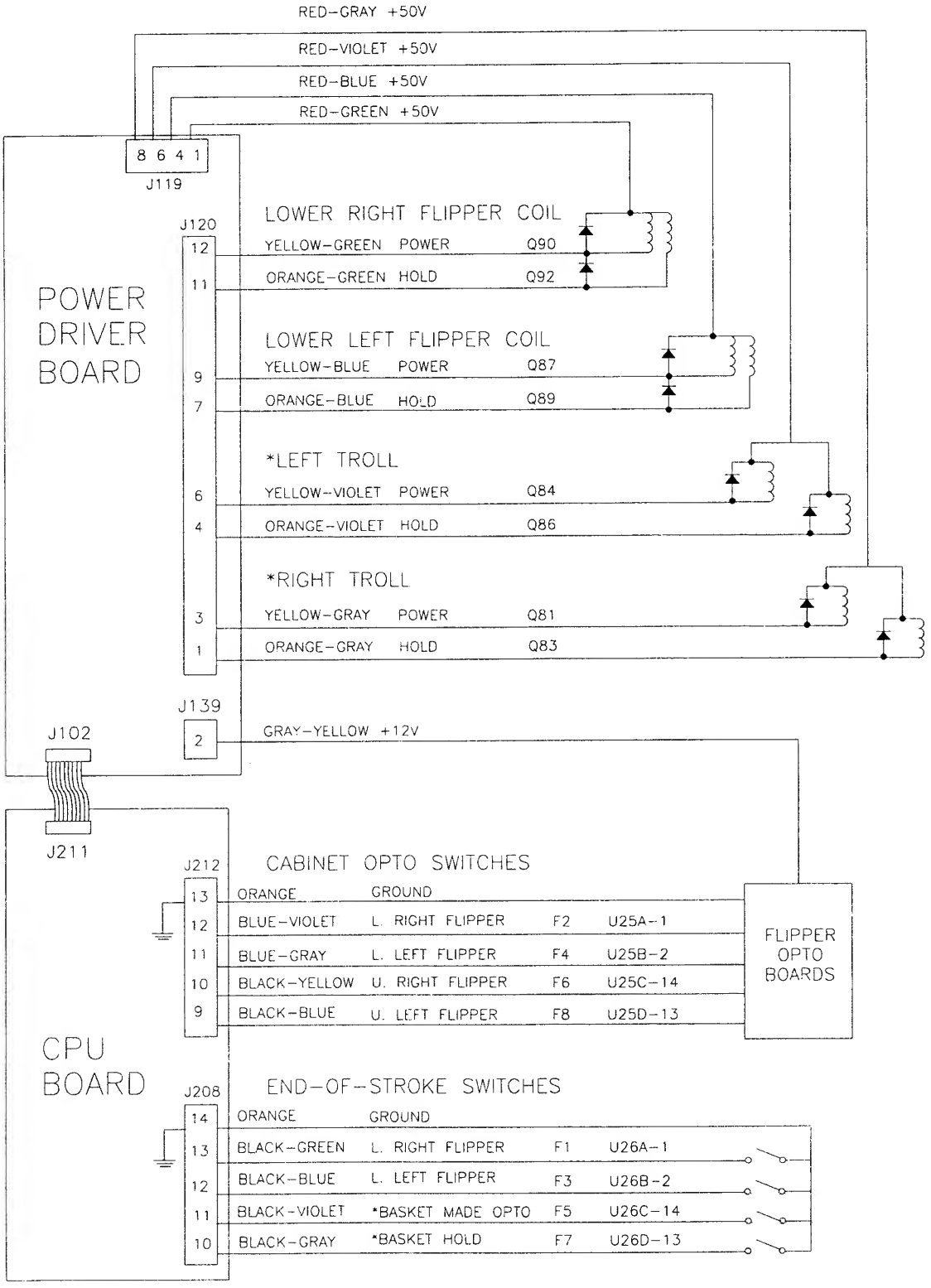
Figure #2

There are five general illumination strings; three like figure #1 and two like figure #2. When point "A" toggles low, points, "B" and "C" are high. This turns on the triac and the desired general illumination string of lights.

BLOCK DIAGRAM OF GENERAL ILLUMINATION CIRCUIT



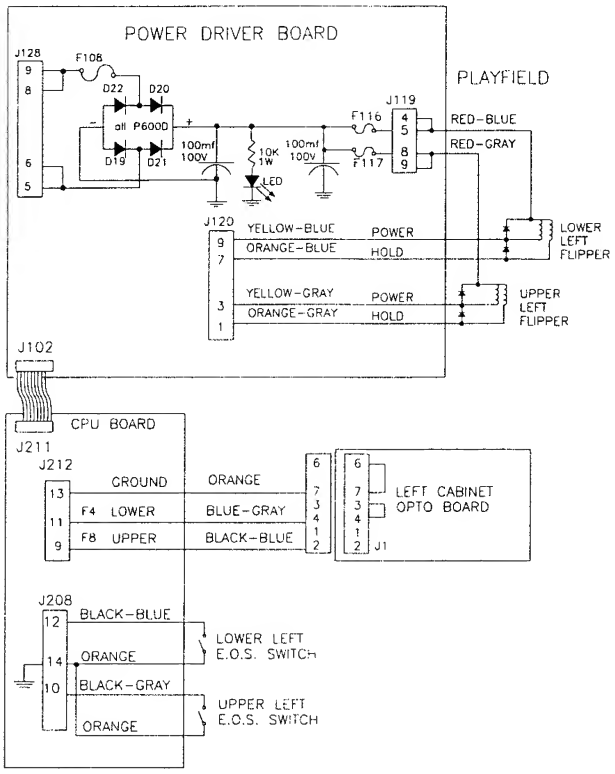
FLIPPER CIRCUIT DIAGRAM



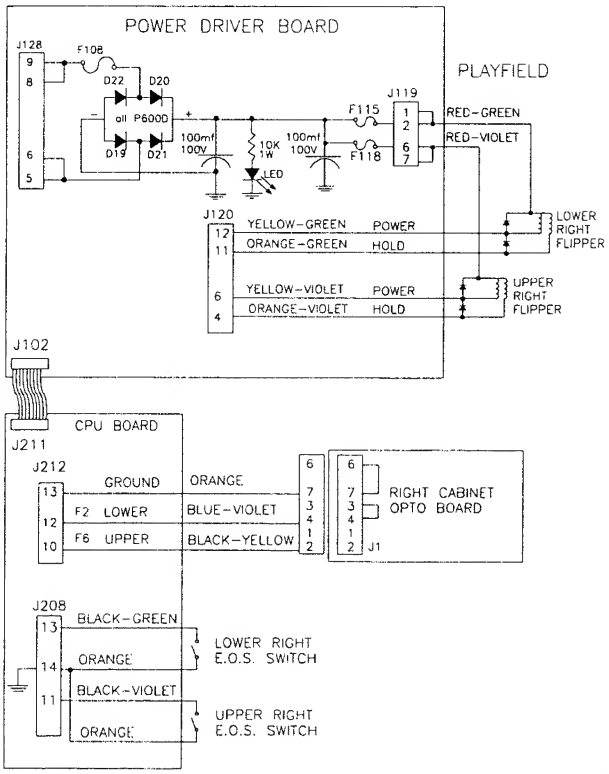
*** The UPPER RIGHT FLIPPER circuit is used for the LEFT TROLL. The UPPER LEFT FLIPPER circuit is used for the RIGHT TROLL.**

FLIPPER COIL CIRCUITS

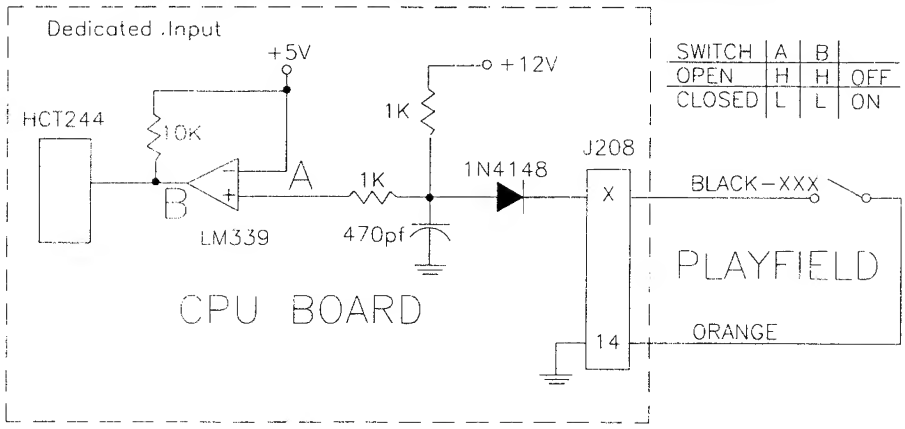
LEFT FLIPPER CIRCUIT



RIGHT FLIPPER CIRCUIT



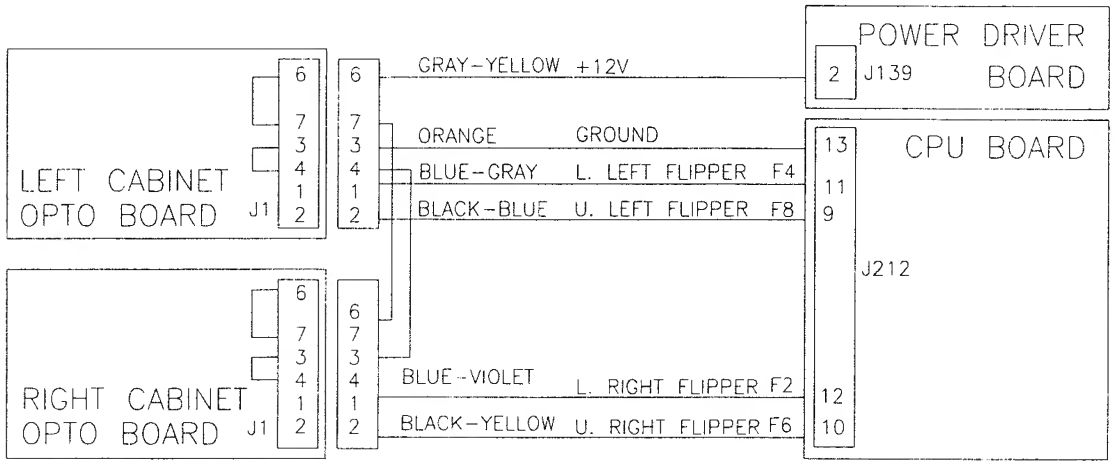
FLIPPER END-OF-STROKE SWITCH CIRCUIT

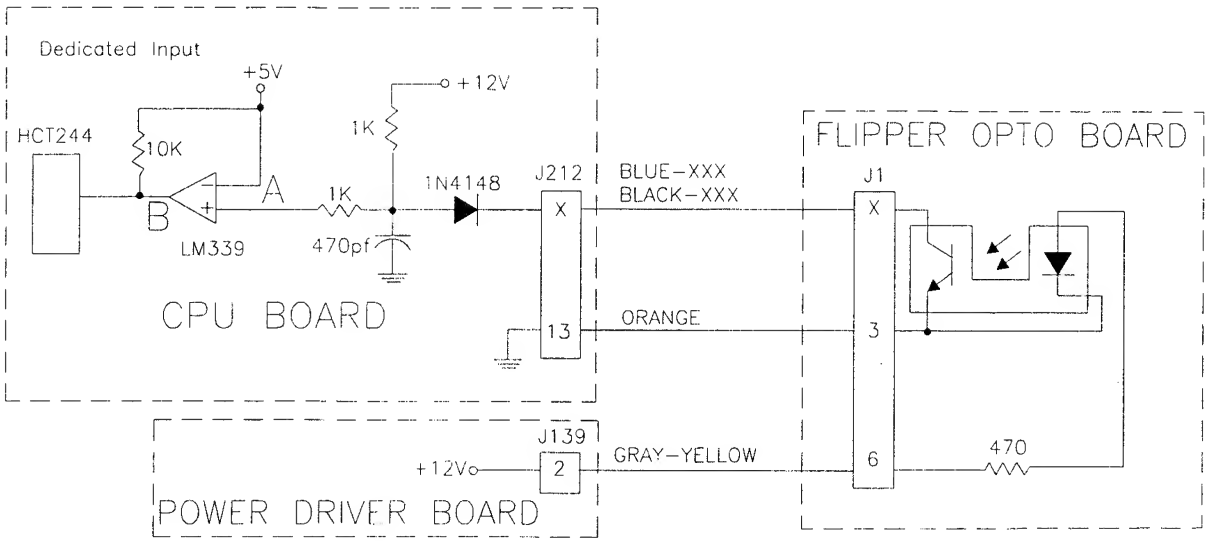


The flipper E.O.S. circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

When a switch closes, the row side, (dedicated input), of the circuit activates. The "+" input of the LM339 drops below +5V therefore its output is low. Since the row (dedicated input), circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row (dedicated input) is inactive.

FLIPPER CABINET SWITCH CIRCUITS

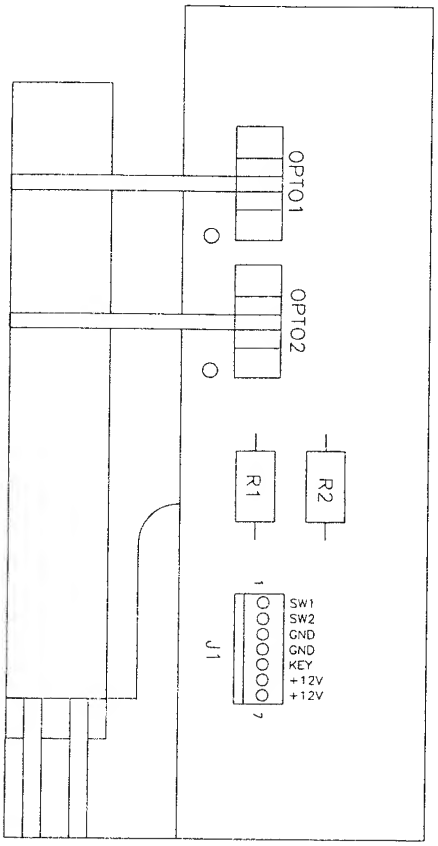


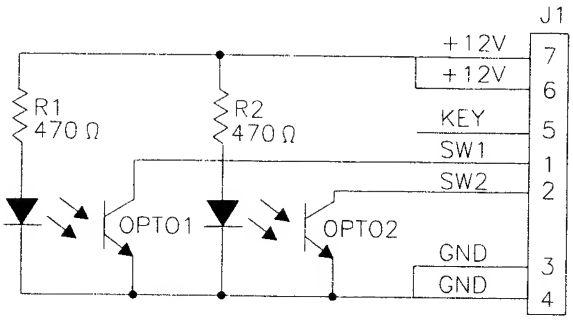


The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch circuit.

When a switch closes, the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V, therefore, its output is low. Since the row, (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row, (dedicated Input) is inactive.

FLIPPER OPTO BOARD ASSEMBLY
A-17316





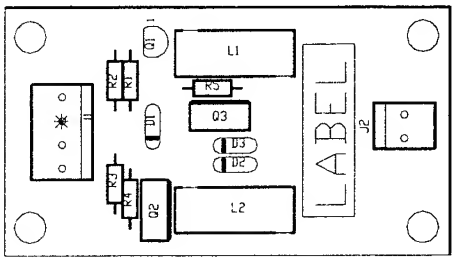
Left Flipper Opto Board Assembly

J1-1 Black-Blue from CPU board J212-9
J1-2 Blue-Gray from CPU board J212-11
J1-3 N/C
J1-4 Orange from CPU board J212-13
J1-5 N/C
J1-6 Gray-Yellow from Power Driver Board J139-2
J1-7 Gray-Yellow from Power Driver Board J139-2

Right Flipper Opto Board Assembly

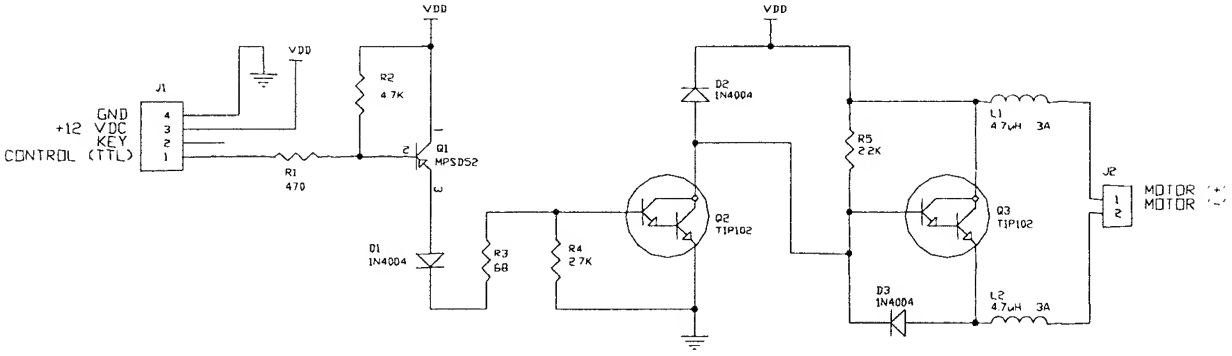
J1-1 Black-Yellow from CPU board J212-10
J1-2 Blue-Violet from CPU board J212-12
J1-3 Orange from CPU board J212-13
J1-4 Orange from Left Flipper Opto Board Assy J1-4
J1-5 N/C
J1-6 Gray-Yellow from Left Flipper Opto Board Assy J1-6
J1-7 N/C

Motor Driver EMI w/Brake Board Assembly
A-21708-1
(FOR DRAWBRIDGE UP/DOWN MOTOR)

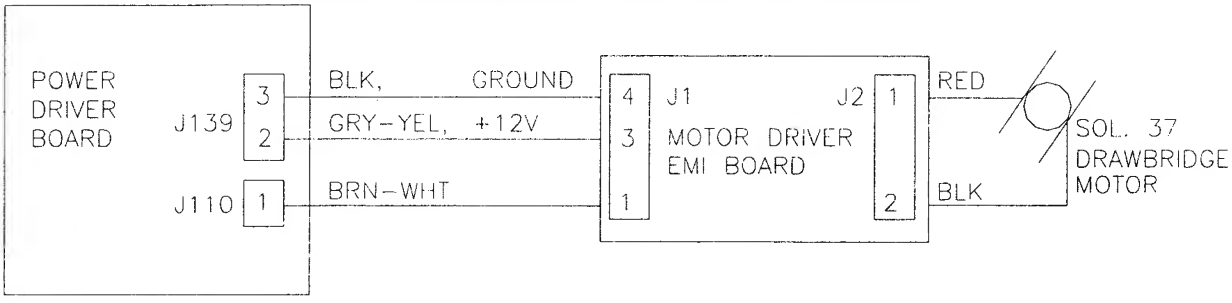


J1-1	BRN-WHT	Solenoid #37 drive from Power Driver Board J110-1
J1-2	KEY	
J1-3	GRY-YEL	+12V from Power Driver Board J139-2
J1-4	BLK	Ground from Power Driver Board J139-3
J2-1	RED	Power to DRAWBRIDGE MOTOR solenoid #37
J2-2	BLK	Ground to DRAWBRIDGE MOTOR solenoid #37

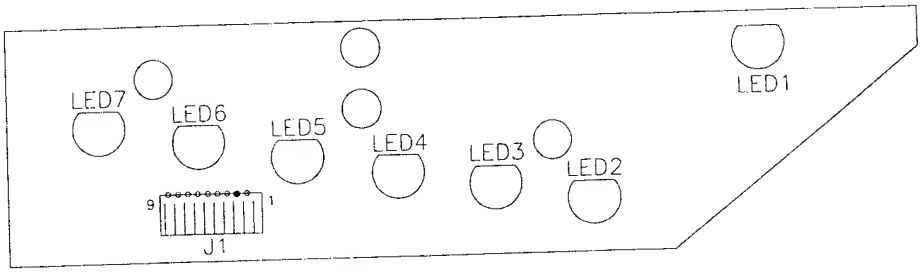
Motor Driver EMI w/Brake Schematic

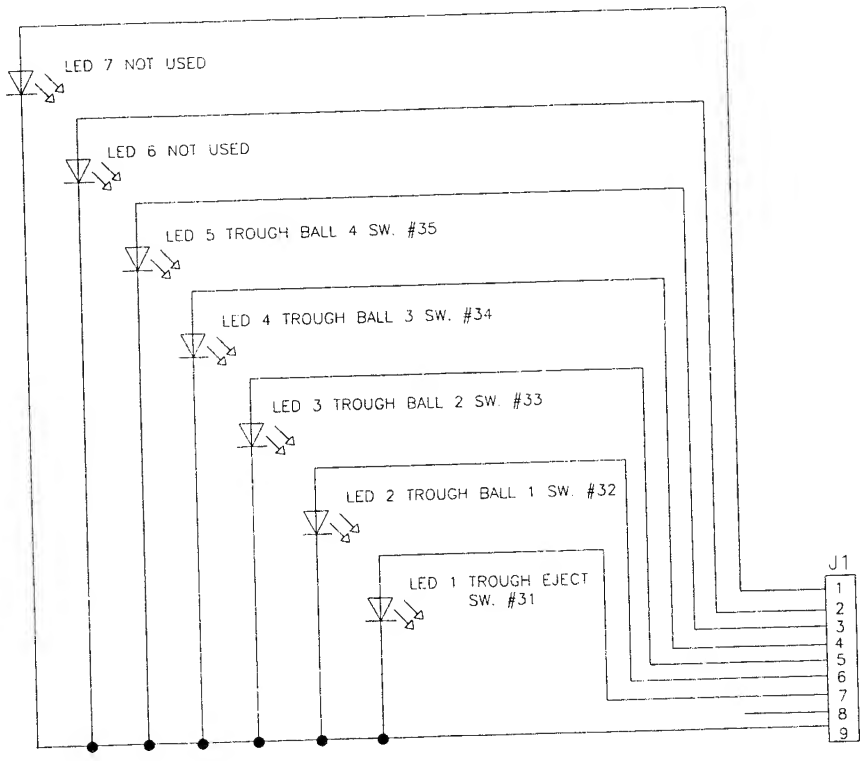


Drawbridge Motor Circuit Wiring Diagram



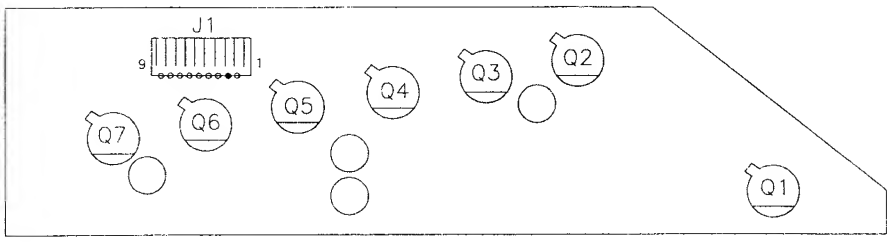
Trough IR LED Board Assembly
(transmitter - green board)
A-18617-1

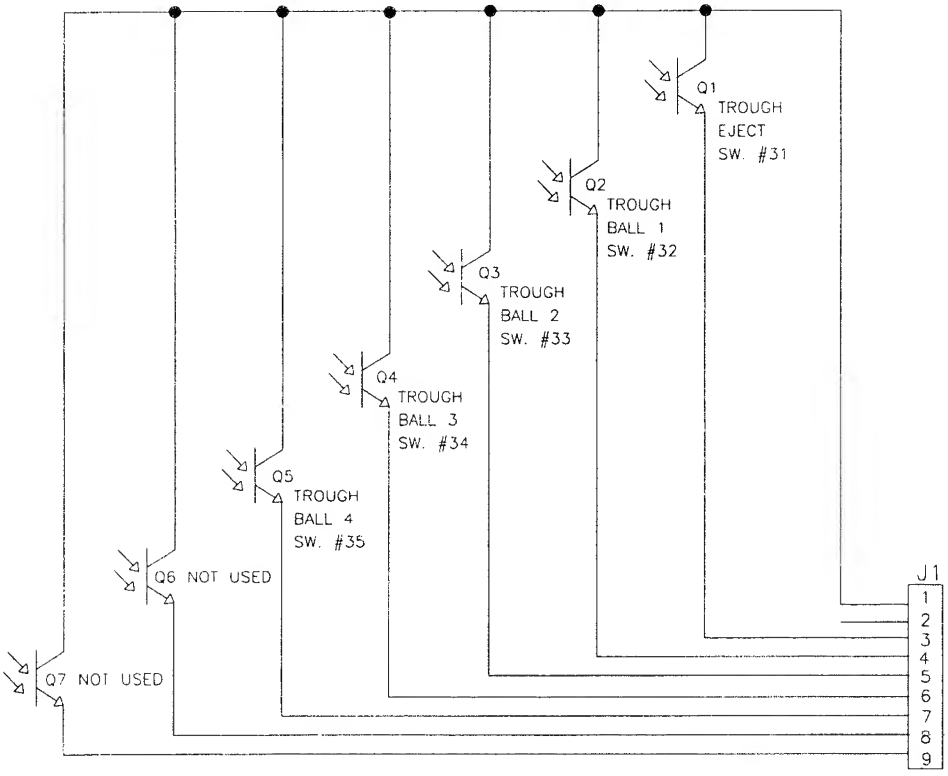




J1-1	N/C	
J1-2	N/C	
J1-3	GRY-GRN,	For TROUGH BALL 4 switch #35 from 10-Opto Switch Board J1-3
J1-4	GRY-BLK,	For TROUGH BALL 3 switch #34 from 10-Opto Switch Board J1-4
J1-5	GRY-ORG,	For TROUGH BALL 2 switch #33 from 10-Opto Switch Board J1-5
J1-6	GRY-RED,	For TROUGH BALL 1 switch #32 from 10-Opto Switch Board J1-6
J1-7	GRY-BRN,	For TROUGH EJECT switch #31 from 10-Opto Switch Board J1-7
J1-8	KEY	
J1-9	BLK,	Ground from 10-Opto Switch Board J1-9

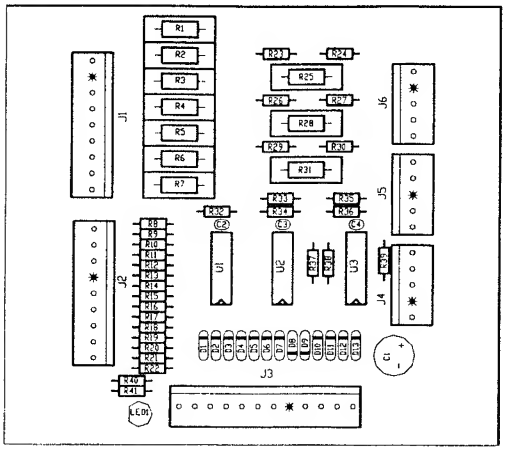
Trough IR Photo Transistor Board Assembly
(receiver - blue board)
A-18618-1





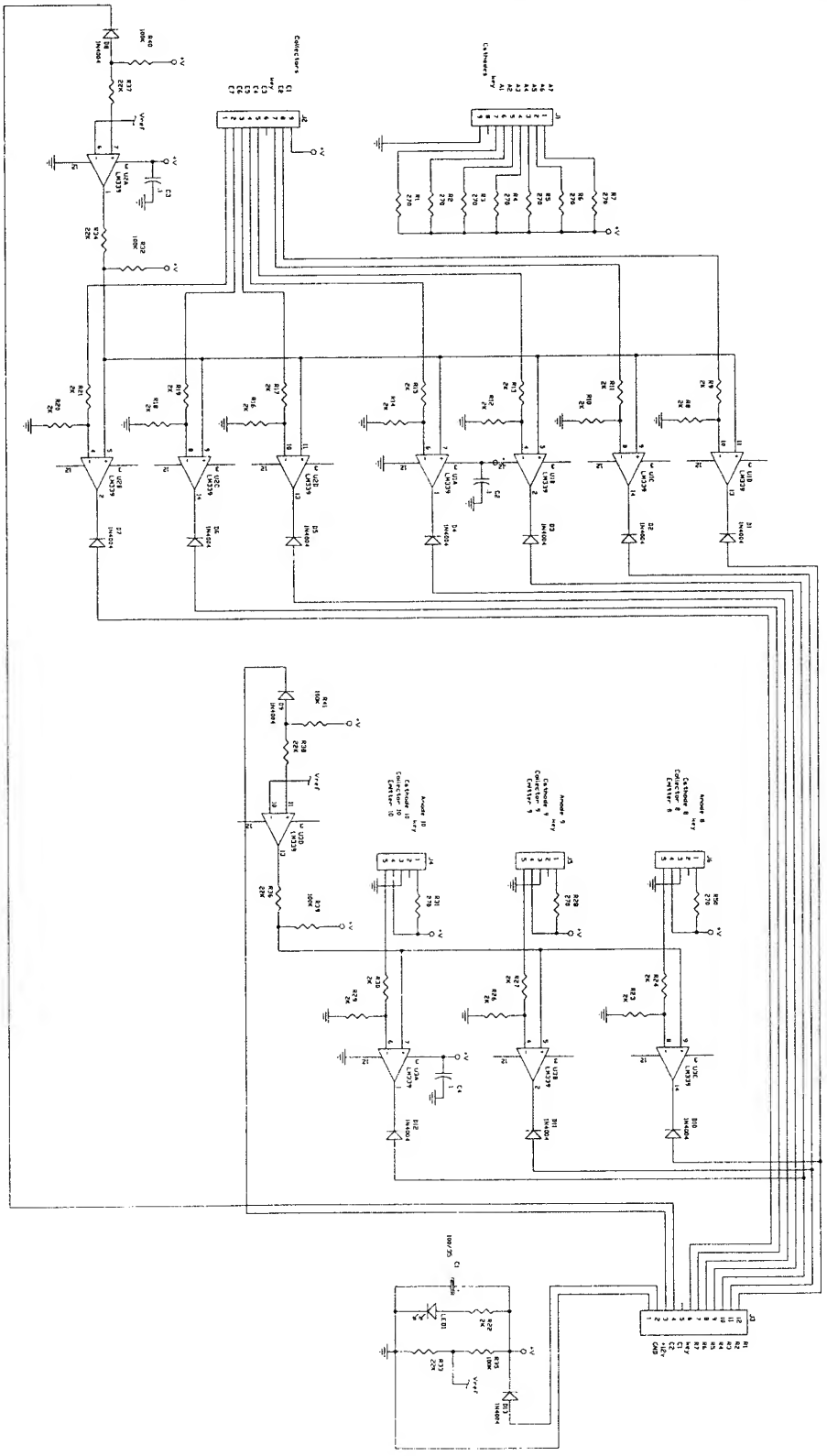
J1-1 GRY-YEL, +12V from 10-Opto Switch Board J2-9
J1-2 KEY
J1-3 ORG-BRN, For TROUGH EJECT switch #31 from 10-Opto Switch Board J2-8
J1-4 ORG-RED, For TROUGH BALL 1 switch #32 from 10-Opto Switch Board J2-7
J1-5 ORG-BLK, For TROUGH BALL 2 switch #33 from 10-Opto Switch Board J2-5
J1-6 ORG-YEL, For TROUGH BALL 3 switch #34 from 10-Opto Switch Board J2-4
J1-7 ORG-GRN, For TROUGH BALL 4 switch #35 from 10-Opto Switch Board J2-3
J1-8 N/C
J1-9 N/C

10-Opto Switch Board Assembly
A-18159.1
(FOR BALL TROUGH, MOAT ENTER, LEFT POPPER, AND CASTLE GATE OPTO SWITCHES)



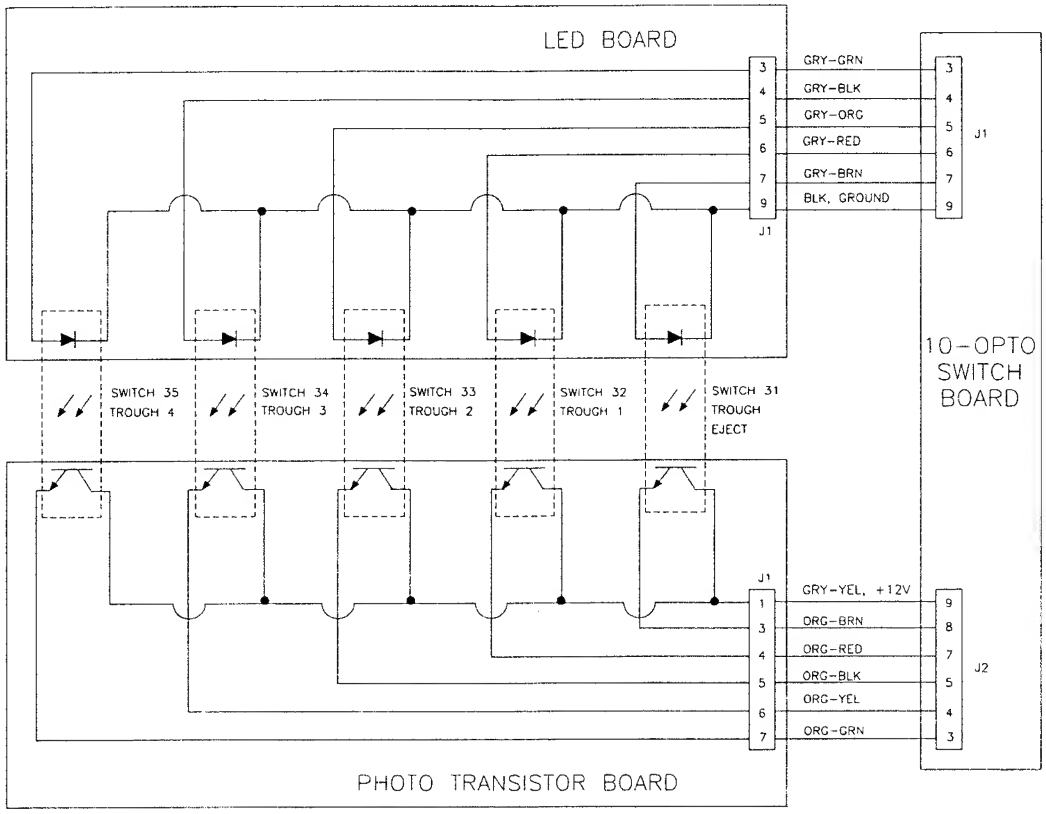
J1-1	ORG-VIO,	To CASTLE GATE switch #37 Photo Transistor Board
J1-2	ORG-BLU,	To LEFT POPPER switch #36 Photo Transistor Board
J1-3	ORG-GRN,	To Ball Trough Photo Transistor Board for TROUGH BALL 4 switch #35
J1-4	ORG-YEL,	To Ball Trough Photo Transistor Board for TROUGH BALL 3 switch #34
J1-5	ORG-BLK,	To Ball Trough Photo Transistor Board for TROUGH BALL 2 switch #33
J1-6	KEY	
J1-7	ORG-RED,	To Ball Trough Photo Transistor Board for TROUGH BALL 1 switch #32
J1-8	ORG-BRN,	To Ball Trough Photo Transistor Board for TROUGH EJECT switch #31
J1-9	GRY-YEL,	+12V to the above listed Photo Transistor Boards
J2-1	GRY-VIO,	To CASTLE GATE switch #37 LED Board
J2-2	GRY-BLU,	To LEFT POPPER switch #36 LED Board
J2-3	GRY-GRN,	To Ball Trough LED Board for TROUGH BALL 4 switch #35
J2-4	GRY-BLK,	To Ball Trough LED Board for TROUGH BALL 3 switch #34
J2-5	GRY-ORG,	To Ball Trough LED Board for TROUGH BALL 2 switch #33
J2-6	GRY-RED,	To Ball Trough LED Board for TROUGH BALL 1 switch #32
J2-7	GRY-BRN,	To Ball Trough LED Board for TROUGH EJECT switch #31
J2-8	KEY	
J2-9	BLK,	Ground to the above listed LED Boards
J3-1	BLK,	For Ground from Power Driver Board J139-3
J3-2	GRY-YEL,	For +12V from Power Driver Board J139-2
J3-3	GRN-WHT,	For switch column 4 from CPU Board J206-4
J3-4	GRN-ORG,	For switch column 3 from CPU Board J206-3
J3-5	KEY	
J3-6	WHT-VIO,	For switch row 7 from CPU Board J208-8
J3-7	WHT-BLU,	For switch row 6 from CPU Board J208-7
J3-8	WHT-GRN,	For switch row 5 from CPU Board J208-5
J3-9	WHT-YEL,	For switch row 4 from CPU Board J208-4
J3-10	WHT-ORG,	For switch row 3 from CPU Board J208-3
J3-11	WHT-RED,	For switch row 2 from CPU Board J208-2
J3-12	WHT-BRN,	For switch row 1 from CPU Board J208-1
J4		NOT USED
J5		NOT USED
J6-1	GRN-BRN,	To MOAT ENTER switch #41 LED Board
J6-2	KEY	
J6-3	BLK,	Ground to MOAT ENTER switch #41 LED Board
J6-4	GRY-YEL,	+12V to MOAT ENTER switch #41 Photo Transistor Board
J6-5	WHT-BRN,	To MOAT ENTER switch #41 Photo Transistor Board

10-Opto Switch Board Schematic
A-18159.1
(FOR BALL TROUGH, MOAT ENTER, LEFT POPPER, AND CASTLE GATE OPTO SWITCHES)

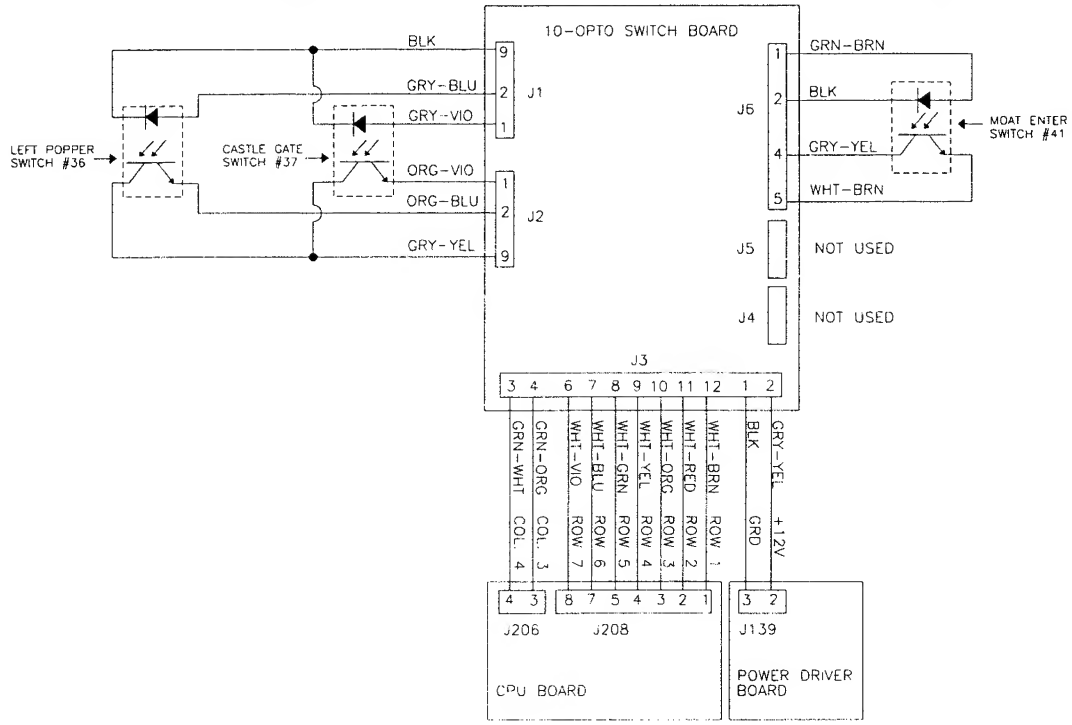


IN OPTO SWITCHES, THE BALL ROLLS BETWEEN THE LED BOARD AND THE PHOTO TRANSISTOR BOARD AND BREAKS THE BEAM. THE BROKEN BEAM 'MAKES' THE SWITCH.

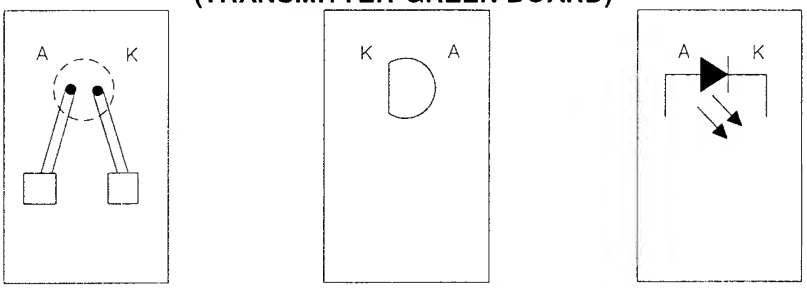
Ball Trough Opto Switches Wiring Diagram



Moat Enter, Left Popper, and Castle Gate Opto Switches Wiring Diagram

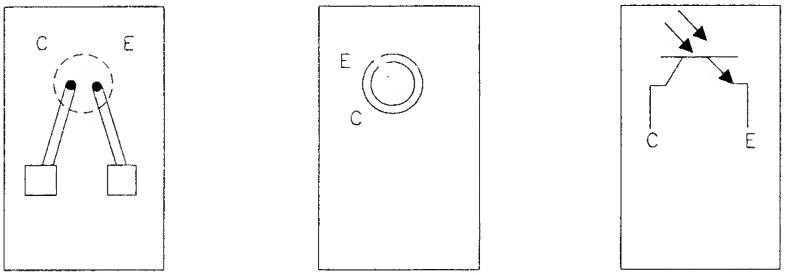


LED BOARD ASSEMBLY
A-16908
(TRANSMITTER-GREEN BOARD)



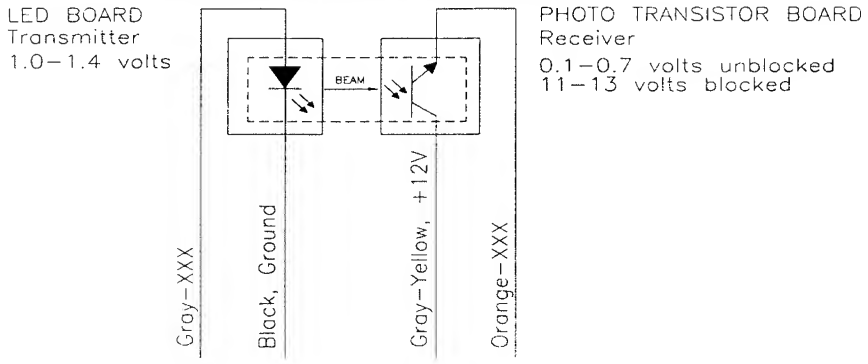
solder side component side schematic

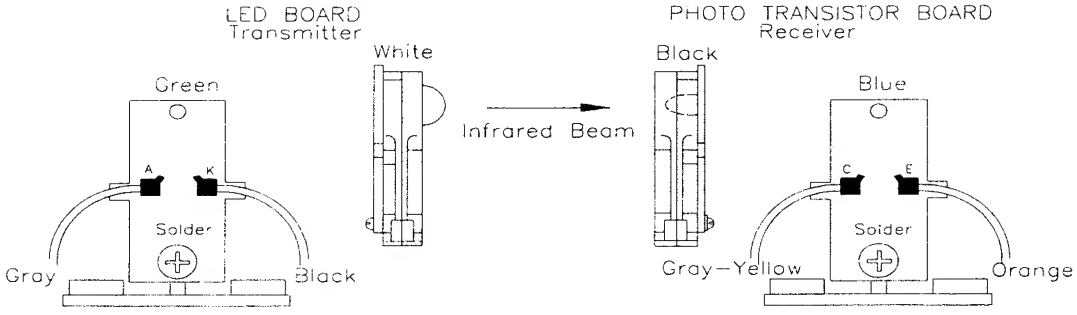
PHOTO TRANSISTOR BOARD ASSEMBLY
A-16909
(RECEIVER-BLUE BOARD)



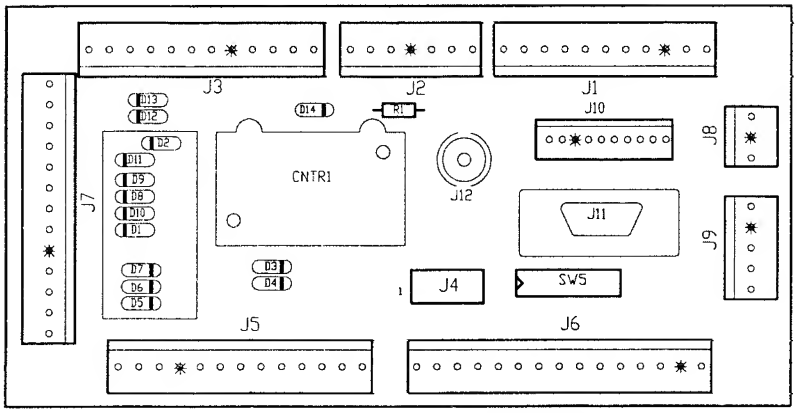
solder side component side schematic

TYPICAL CIRCUIT DIAGRAM





Coin Door Interface Board
A-20580



J1-1	ORG-GRY	Dedicated sw row #8 from CPU J205-9.
J1-2	ORG-VIO	Dedicated sw row #7 from CPU J205-8.
J1-3	ORG-BLU	Dedicated sw row #6 from CPU J205-7.
J1-4	ORG-GRN	Dedicated sw row #5 from CPU J205-6.
J1-5	ORG-YEL	Dedicated sw row #4 from CPU J205-4.
J1-6	ORG-BLK	Dedicated sw row #3 from CPU J205-3.
J1-7	ORG-RED	Dedicated sw row #2 from CPU J205-2.
J1-8	ORG-BRN	Dedicated sw row #1 from CPU J205-1.
J1-9	KEY	
J1-10	BLK	Ground from CPU J205-10
J1-11	ORG-WHT	Switch enable from CPU J205-12.

J2-1	BLK	Ground from Power Driver board J141-3.
J2-2	GRY-YEL	+12VAC from Power Driver board J141-2.
J2-3	WHT-VIO	6.8VAC from Power Driver board J104-1.
J2-4	KEY	
J2-5	VIO	For G.I. from Power Driver board J104-3.
J2-6	N/C	
J2-7	BLK-WHT	Signal for coin meter from Power Driver board J139-5.

J3-1	GRN-BRN	Switch column #1 from CPU J212-1.
J3-2	GRN-RED	Switch column #2 from CPU J212-2.
J3-3	WHT-BRN	Switch row #1 from CPU J212-4.
J3-4	WHT-RED	Switch row #2 from CPU J212-5.
J3-5	WHT-ORG	Switch row #3 from CPU J212-6.
J3-6	WHT-YEL	Switch row #4 from CPU J212-7.
J3-7	KEY	
J3-8	YEL-GRY	Lamp col #8 from Pwr Drvr brd J122-3.
J3-9	RED-BLU	Lamp row #6 from Pwr Drvr brd J125-7.
J3-10	RED-VIO	Lamp row #7 from Pwr Drvr brd J125-8.
J3-11	RED-GRY	Lamp row #8 from Pwr Drvr brd J125-9.

J4 NOT USED

J5-1	VIO	Return to coin door.
J5-2	WHT-VIO	6.8VAC for G.I. to coin door.
J5-3	BLK	Ground to coin door.
J5-4	ORG-BRN	Dedicated switch row #1 to coin door.
J5-5	ORG-RED	Dedicated switch row #2 to coin door.
J5-6	ORG-BLK	Dedicated switch row #3 to coin door.
J5-7	ORG-GRN	Dedicated switch row #5 to coin door.
J5-8	ORG-BLU	Dedicated switch row #6 to coin door.
J5-9	ORG-VIO	Dedicated switch row #7 to coin door.
J5-10	KEY	
J5-11	ORG-GRY	Dedicated switch row #8 to coin door.
J5-12	GRN-RED	Switch column #2 to coin door Slam Tilt.
J5-13	WHT-BRN	Switch row #1 to coin door Slam Tilt.

J6 NOT USED

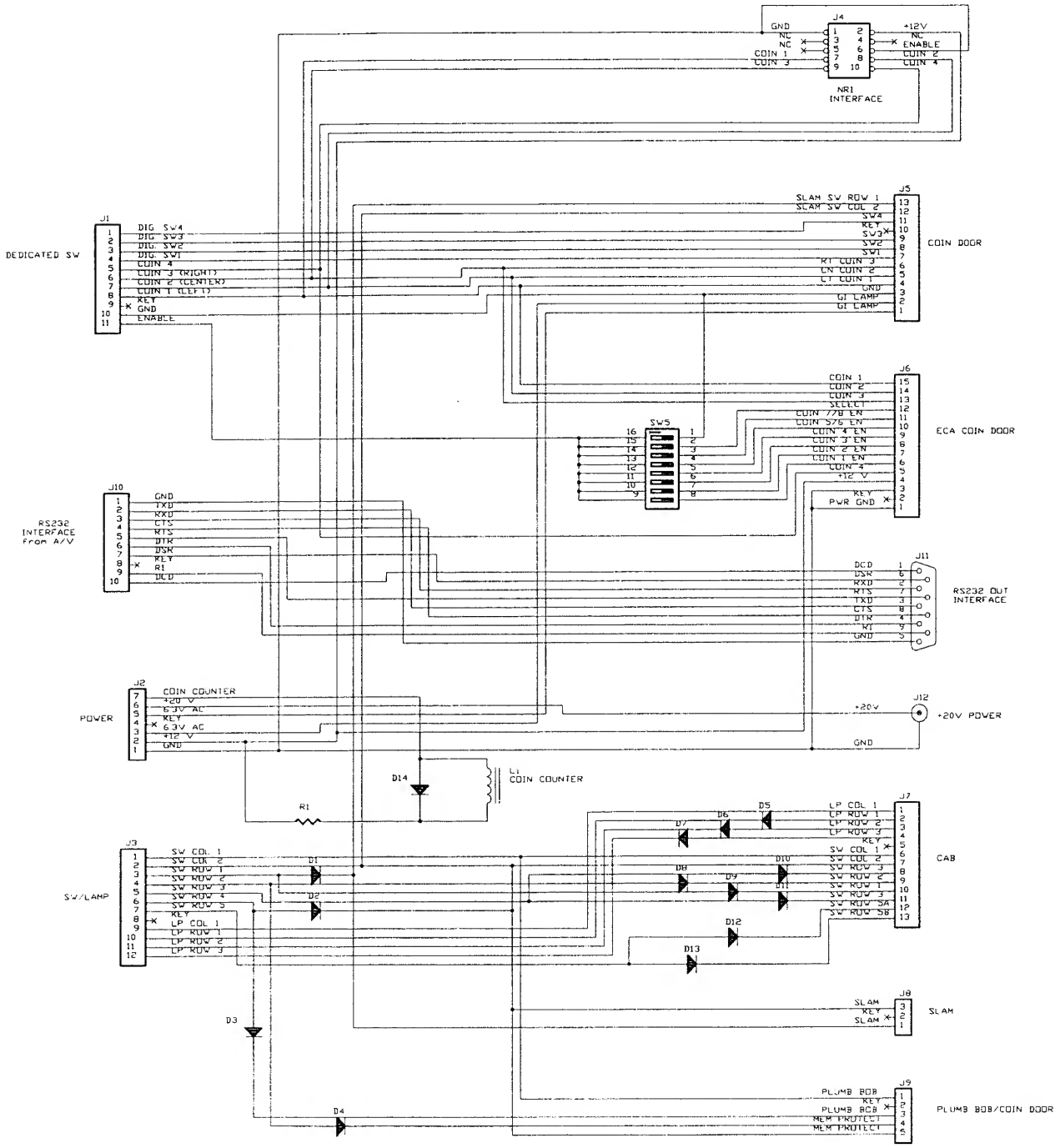
J7-1	YEL-GRY	Lamp column #8 to cabinet.
J7-2	N/C	
J7-3	RED-BLU	Lamp row #6 to cabinet.
J7-4	RED-GRY	Lamp row #8 to cabinet.
J7-5	KEY	
J7-6	GRN-BRN	Switch column #1 to cabinet.
J7-7	N/C	
J7-8	N/C	
J7-9	N/C	
J7-10	WHT-BRN	Switch row #1 to cabinet.
J7-11	WHT-ORG	Switch row #3 to cabinet.
J7-12	N/C	
J7-13	N/C	

J8-1	WHT	Switch row to cabinet for Slam tilt.
J8-2	KEY	
J8-3	GRN	Switch column to cabinet for Slam Tilt.

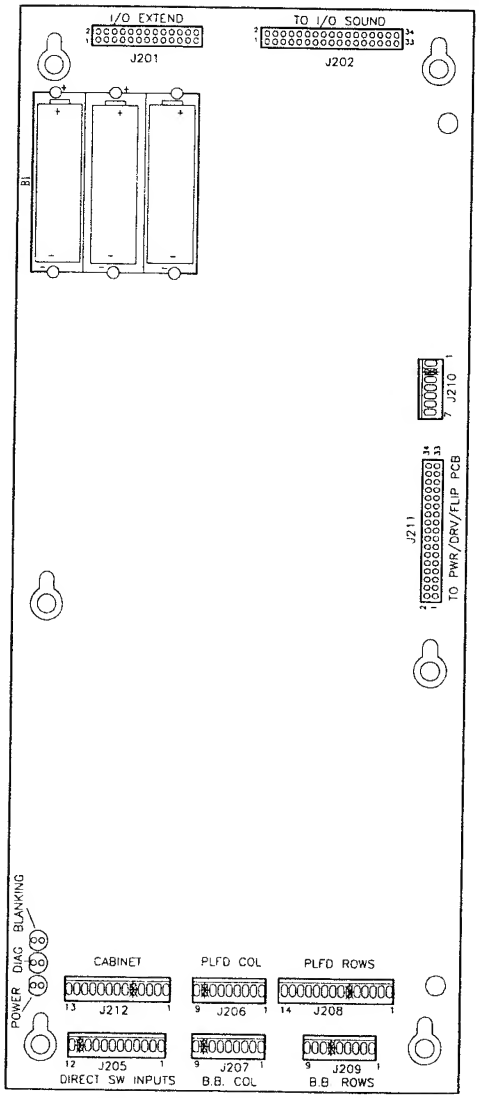
J9-1	WHT-YEL	Switch row #4 to Plumb Bob Tilt.
J9-2	KEY	
J9-3	GRN-BRN	Switch column #1 to Plumb Bob Tilt.
J9-4	WHT-RED	Switch row #2 to Interlock Switch.
J7-5	GRN-RED	Switch column #2 to Interlock Switch.

J10	Ribbon cable	To cash flow mechanism (if used).

Coin Door Interface Board Schematic
A-20580



Security CPU Board Assembly
A-21377-50059

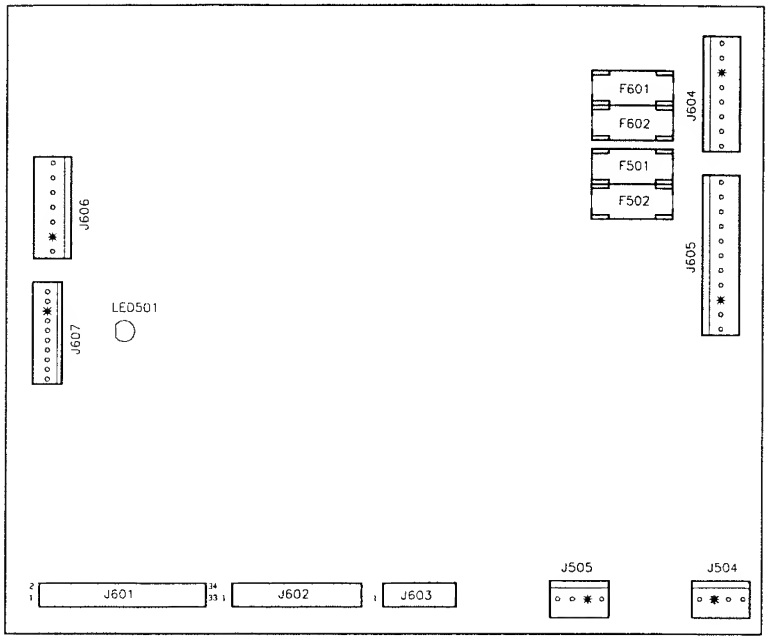


J201	26-pin ribbon cable	Data to/from J602.
J202	34-pin ribbon cable	Data to/from J601.
J203	NOT USED	
J204	NOT USED	

J205-1	ORG-BRN	Dedicate sw row #1 to Coin Door brd J1-8.
J205-2	ORG-RED	Dedicate sw row #2 to Coin Door brd J1-7.
J205-3	ORG-BLK	Dedicate sw row #3 to Coin Door brd J1-6.
J205-4	ORG-YEL	Dedicate sw row #4 to Coin Door brd J1-5.
J205-5	N/C	
J205-6	ORG-GRN	Dedicate sw row #5 to Coin Door brd J1-4.
J205-7	ORG-BLU	Dedicate sw row #6 to Coin Door brd J1-3.
J205-8	ORG-VIO	Dedicate sw row #7 to Coin Door brd J1-2.
J205-9	ORG-GRY	Dedicate sw row #8 to Coin Door brd J1-1.
J205-10	BLK	Ground to Coin Door board J1-10.
J205-11	KEY	
J205-12	ORG-WHT	Switch enable to Coin Door brd J1-11.

J206-1	GRN-BRN	Switch column #1 to playfield switches.
J206-2	GRN-RED	Switch column #2 to playfield switches.
J206-3	GRN-ORG	Switch column #3 to playfield switches.
J206-4	GRN-WHT	Switch column #4 to playfield switches.
J206-5	GRN-BLK	Switch column #5 to playfield switches.
J206-6	GRN-BLU	Switch column #6 to playfield switches.
J206-7	GRN-VIO	Switch column #7 to playfield switches.
J206-8	KEY	
J206-9	N/C	
J207	NOT USED	
J208-1	WHT-BRN	Switch row #1 to playfield switches.
J208-2	WHT-RED	Switch row #2 to playfield switches.
J208-3	WHT-ORG	Switch row #3 to playfield switches.
J208-4	WHT-YEL	Switch row #4 to playfield switches.
J208-5	WHT-GRN	Switch row #5 to playfield switches.
J208-6	KEY	
J208-7	WHT-BLU	Switch row #6 to playfield switches.
J208-8	WHT-VIO	Switch row #7 to playfield switches.
J208-9	WHT-GRY	Switch row #8 to playfield switches.
J208-10	N/C	
J208-11	N/C	
J208-12	BLK-BLU	To lower left E.O.S. switch #F3.
J208-13	BLK-GRN	To lower right E.O.S. switch #F1.
J208-14	ORG	E.O.S. switch ground.
J209	NOT USED	
J210-1	BLK	Ground from Power Driver brd J101-5, 7.
J210-2	KEY	
J210-3	BLK	Ground from Power Driver brd J101-5, 7.
J210-4	GRY	+5V from Power Driver board J101-3, 4.
J210-5	GRY	+5V from Power Driver board J101-3, 4.
J210-6	GRY-GRN	+12V from Power Driver board J101-1, 2.
J210-7	GRY-GRN	+12V from Power Driver board J101-1, 2.
J211	34-pin ribbon cable	Data to/from J102.
J212-1	GRN-BRN	Switch col. #1 to Coin Door board J3-1.
J212-2	GRN-RED	Switch col. #2 to Coin Door board J3-2.
J212-3	N/C	
J212-4	WHT-BRN	Switch row #1 to Coin Door board J3-3.
J212-5	KEY	
J212-6	WHT-RED	Switch row #2 to Coin Door board J3-4.
J212-7	WHT-ORG	Switch row #3 to Coin Door board J3-5
J212-8	WHT-YEL	Switch row #4 to Coin Door board J3-6
J212-9	BLK-BLU	To switch #F8 left flipper opto brd J1-1.
J212-10	BLK-YEL	To switch #F6 right flipper opto brd J1-1.
J212-11	BLU-GRY	To switch #F4 left flipper opto brd J1-2.
J212-12	BLU-VIO	To switch #F2 right flipper opto brd J1-2.
J212-13	ORG	Ground to left flipper opto board J1-4.

Audio Visual Board Assembly
A-20516-50059



J601	34-pin ribbon cable	Data to/from CPU J202.
J602	26-pin ribbon cable	Data to/from CPU J201.
J603	14-pin ribbon cable	Data to/from Dot Matrix Display Driver board.

J604-1	ORG	-125V to display driver pin 1.
J604-2	BLU	-113V to display driver pin 2.
J604-3	KEY	
J604-4	BLK	Ground to display driver pin 4.
J604-5	BLK	Ground to display driver pin 5.
J604-6	GRY	+5V to display driver pin 6.
J604-7	GRY-YEL	+12V to display driver pin 7.
J604-8	BRN	+62 to display driver pin 8.

J605-1	WHT	80VAC from transformer secondary.
J605-2	WHT	80VAC from transformer secondary.
J605-3	VIO	100VAC from transformer secondary.
J605-4	VIO	100VAC from transformer secondary.
J605-5	GRY-WHT	18VAC from transformer secondary.
J605-6	GRY-WHT	Loop from J605-7.
J605-7	GRY	18VAC from transformer secondary.
J605-8	GRY	Loop from J605-7.
J605-9	KEY	
J605-10	GRY-GRN	18VAC from transformer secondary.
J605-11	GRY-GRN	Loop from J605-10.

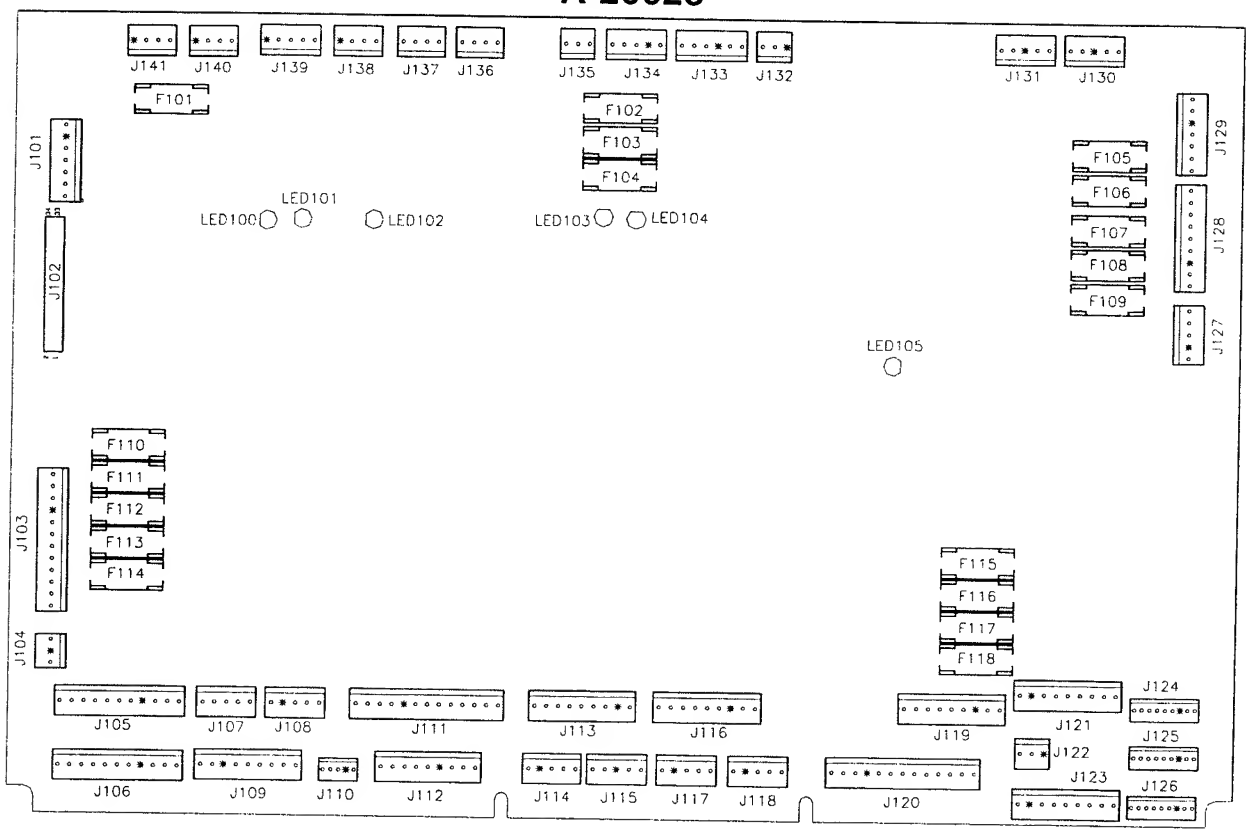
J606-1	BLK	Ground form Power Driver brd J101-7.
J606-2	KEY	
J606-3	BLK	Ground from Power Driver brd J101-5.
J606-4	GRY	+5V from Power Driver board J101-4.
J606-5	GRY	+5V from Power Driver board J101-3.
J606-6	GRY-GRN	+12V from Power Driver board J101-2.
J606-7	GRY-GRN	+12V from Power Driver board J101-1.

J607 NOT USED

J504-1	BLK-YEL	Signal to speaker.
J504-2	KEY	
J504-3	N/C	
J504-4	BLK	Signal to speaker.

J505-1	BLK-YEL	Signal to speaker.
J505-2	KEY	
J505-3	N/C	
J505-4	BLK	Signal to speaker.

Power Driver Board Assembly
A-20028



J101-1	GRY-GRN	+12V to J210-6, 7; J606-1.
J101-2	GRY-GRN	+12V to J210-6, 7; J606-2.
J101-3	GRY	+5V to J210-4, 5; J3-1, 3; J606-3.
J101-4	GRY	+5V to J210-4, 5; J3-1, 3; J606-4.
J101-5	BLK	Ground to J210-1, 3; J606-5.
J101-6	KEY	
J101-7	BLK	Ground to J210-1,3; J606-7.

J102	34-pin ribbon cable	Data to/from CPU J211.

J103-1	YEL-WHT	6.8Vac from transformer secondary.
J103-2	WHT-BRN	6.8Vac from transformer secondary.
J103-3	WHT-BRN	6.8Vac from transformer secondary.
J103-4	WHT-ORG	6.8Vac from transformer secondary.
J103-5	WHT-YEL	6.8Vac from transformer secondary.
J103-6	WHT-YEL	6.8Vac from transformer secondary.
J103-7	ORG	6.8Vac from transformer secondary.
J103-8	ORG	6.8Vac from transformer secondary.
J103-9	KEY	
J103-10	GRN	6.8Vac from transformer secondary.
J103-11	BRN	6.8Vac from transformer secondary.
J103-12	BRN	6.8Vac from transformer secondary.

J104-1	VIO	Return for G.I. to Coin Door board J2-3.
J104-2	KEY	
J104-3	WHT-VIO	6.8VAC for G.I. to Coin Door brd J2-5.

J105-1	BRN	Return for G.I. to insert panel.
J105-2	ORG	Return for G.I. to insert panel.
J105-3	YEL	Return for G.I. to insert panel.
J105-4	KEY	
J105-5	N/C	
J105-6	N/C	
J105-7	WHT-BRN	6.8VAC for G.I. to insert panel.
J105-8	WHT-ORG	6.8VAC for G.I. to insert panel.
J105-9	WHT-YEL	6.8VAC for G.I. to insert panel.
J105-10	N/C	
J105-11	N/C	

J106-1	BRN	Return for G.I. to playfield.
J106-2	N/C	
J106-3	N/C	
J106-4	KEY	
J106-5	GRN	Return for G.I. to playfield.
J106-6	VIO	Return for G.I. to playfield.
J106-7	WHT-BRN	6.8VAC for G.I. to playfield.
J106-8	N/C	
J106-9	N/C	
J106-10	WHT-GRN	6.8VAC for G.I. to playfield.
J106-11	WHT-VIO	6.8VAC for G.I. to playfield.

J107	NOT USED

J108	NOT USED

Power Driver Board Continued...

J109-1	BLU-BRN	For solenoid #25 drive to Moat Flashers.
J109-2	BLU-RED	For slnd #26 drive to Tower Lock Post.
J109-3	BLU-ORG	For solenoid #27 drive to Right Gate.
J109-4	BLU-YEL	For solenoid #28 drive to Left Gate.
J109-5	N/C	
J109-6	RED-ORG	Tieback diode
J109-7	KEY	
J109-8	RED-ORG	Tieback diode
J109-9	RED-ORG	Tieback diode

J110-1	BRN-WHT	For solenoid #37 drive to High Current Driver board.
J110-2	KEY	
J110-3	N/C	
J110-4	N/C	
J110-5	N/C	

J111-1	BLK-BRN	For solenoid #17 drive to playfield flasher.
J111-2	BLK-RED	For solenoid #18 drive to playfield flasher.
J111-3	BLK-ORG	For solenoid #19 drive to playfield flasher.
J111-4	BLK-YEL	For solenoid #20 drive to playfield flasher.
J111-5	BLU-GRN	For solenoid #21 drive to playfield flasher.
J111-6	BLU-BLK	For solenoid #22 drive to playfield flasher.
J111-7	BLU-VIO	For solenoid #23 drive to playfield flasher.
J111-8	BLU-GRY	For solenoid #24 drive to playfield flasher.
J111-9	KEY	
J111-10	N/C	
J111-11	N/C	
J111-12	N/C	
J111-13	N/C	

J112-1	BLK-BRN	For solenoid #17 drive to playfield flasher.
J112-2	BLK-RED	For solenoid #18 drive to playfield flasher.
J112-3	BLK-ORG	For solenoid #19 drive to playfield flasher.
J112-4	KEY	
J112-5	BLK-YEL	For solenoid #20 drive to playfield flasher.
J112-6	N/C	
J112-7	N/C	
J112-8	N/C	
J112-9	N/C	

J113-1	BRN-BLK	For solenoid #9 drive to playfield coil.
J113-2	KEY	
J113-3	BRN-RED	For solenoid #10 drive to playfield coil.
J113-4	BRN-ORG	For solenoid #11 drive to playfield coil.
J113-5	BRN-YEL	For solenoid #12 drive to playfield coil.
J113-6	BRN-GRN	For solenoid #13 drive to playfield coil.
J113-7	BRN-BLU	For solenoid #14 drive to playfield coil.
J113-8	BRN-VIO	For solenoid #15 drive to playfield coil.
J113-9	BRN-GRY	For solenoid #16 drive to playfield coil.

J114	NOT USED	

J115	NOT USED	

J116-1	VIO-BRN	For solenoid #1 drive to playfield coil.
J116-2	VIO-RED	For solenoid #2 drive to playfield coil.
J116-3	KEY	
J116-4	VIO-ORG	For solenoid #3 drive to playfield coil.
J116-5	VIO-YEL	For solenoid #4 drive to playfield coil.
J116-6	VIO-GRN	For solenoid #5 drive to playfield coil.
J116-7	VIO-BLU	For solenoid #6 drive to playfield coil.
J116-8	VIO-BLK	For solenoid #7 drive to playfield coil.
J116-9	VIO-GRY	For solenoid #8 drive to playfield coil.

J117	NOT USED	

J118	NOT USED	

J119-1	RED-GRN	+50V to lower right flipper coil.
J119-2	RED-GRN	Loop from J119-1.
J119-3	KEY	
J119-4	RED-BLU	Loop from J119-5.
J119-5	RED-BLU	+50V to lower left flipper coil.
J119-6	RED-VIO	Loop from J119-7.
J119-7	RED-VIO	+50V to Left Troll.
J119-8	RED-GRY	Loop from J119-9.
J119-9	RED-GRY	+50 V to Right Troll.

J120-1	ORG-GRY	For sol. #36 hold drive to Right Troll.
J120-2	N/C	
J120-3	YEL-GRY	For sol. #35 power drive to Right Troll.
J120-4	N/C	
J120-5	ORG-VIO	For sol. #34 hold drive to Left Troll.
J120-6	YEL-VIO	For sol. #33 power drive to Left Troll.
J120-7	ORG-BLU	For sol. #32 hold drive to low left flipper.
J120-8	N/C	
J120-9	YEL-BLU	For sol. #31 power drive to low left flipper.
J120-10	KEY	
J120-11	ORG-GRN	For sol. #30 hold drive to low right flipper.
J120-12	N/C	
J120-13	YEL-GRN	For sol. #29 power drive to low right flipper.

J121	NOT USED	

J122-1	KEY	
J122-2	N/C	
J122-3	YEL-GRY	For lamp column #8 to cabinet.

J123-1	YEL-BRN	For lamp column #1 to playfield.
J123-2	YEL-RED	For lamp column #2 to playfield.
J123-3	YEL-ORG	For lamp column #3 to playfield.
J123-4	YEL-BLK	For lamp column #4 to playfield.
J123-5	YEL-GRN	For lamp column #5 to playfield.
J123-6	YEL-BLU	For lamp column #6 to playfield.
J123-7	YEL-VIO	For lamp column #7 to playfield.
J123-8	KEY	
J123-9	YEL-GRY	For lamp column #8 to playfield.

J124-1	RED-BRN	For lamp row #1 to playfield.
J124-2	RED-BLK	For lamp row #2 to playfield.
J124-3	KEY	
J124-4	RED-ORG	For lamp row #3 to playfield.
J124-5	RED-YEL	For lamp row #4 to playfield.
J124-6	RED-GRN	For lamp row #5 to playfield.
J124-7	RED-BLU	For lamp row #6 to playfield.
J124-8	RED-VIO	For lamp row #7 to playfield.
J124-9	RED-GRY	For lamp row #8 to playfield.

J125-1	N/C	
J125-2	N/C	
J125-3	KEY	
J125-4	N/C	
J125-5	N/C	
J125-6	N/C	
J125-7	RED-BLU	For lamp row #6 to coin door board J3-9.
J125-8	RED-VIO	For lamp row #7 to coin door brd J3-10.
J125-9	RED-GRY	For lamp row #8 to coin door brd J3-11.

J126	NOT USED	

J127-1	WHT-GRN	9.8VAC from transformer secondary.
J127-2	WHT-GRN	9.8VAC loop from J127-1.
J127-3	WHT-GRN	9.8VAC from transformer secondary.
J127-4	KEY	
J127-5	WHT-GRN	9.8VAC loop from J127-3.

Power Driver Board Continued...

J128-1	WHT-RED	16VAC loop from J128-2.
J128-2	WHT-RED	16VAC from transformer secondary.
J128-3	WHT-RED	16VAC loop from J128-4.
J128-4	WHT-RED	16VAC from transformer secondary.
J128-5	BLK-YEL	16VAC loop from J128-6
J128-6	BLK-YEL	16VAC from transformer secondary.
J128-7	KEY	
J128-8	BLK-YEL	16VAC loop from J128-9.
J128-9	BLK-YEL	16VAC from transformer secondary.

J129-1	RED	9VAC from transformer secondary.
J129-2	RED	9VAC from transformer secondary.
J129-3	KEY	
J129-4	BLU-WHT	13VAC from transformer secondary.
J129-5	BLU-WHT	13VAC loop from J129-4.
J129-6	BLU-WHT	13VAC from transformer secondary.
J129-7	BLU-WHT	13VAC loop from J129-6.

J130	NOT USED

J131	NOT USED

J132	NOT USED

J133-1	RED-ORG	+50V to coils.
J133-2	RED-BRN	+50V to coils.
J133-3	RED-BLK	+50V to coils.
J133-4	KEY	
J133-5	N/C	
J133-6	RED-WHT	+20V to playfield flashers.

J134-1	N/C	
J134-2	N/C	
J134-3	N/C	
J134-4	KEY	
J134-5	RED-WHT	+20V to insert panel flashers.

J135	NOT USED

J136	NOT USED

J137	NOT USED

J138	NOT USED

J139-1	KEY	
J139-2	GRY-YEL	+12V to playfield PC boards.
J139-3	BLK	Ground to playfield PC boards.
J139-4	N/C	
J139-5	BLK-WHT	Signal for coin meter to coin door brd J2-7.

J140-1	KEY	
J140-2	GRY-YEL	+12V
J140-3	BLK	Ground
J140-4	N/C	

J141-1	KEY	
J141-2	GRY-YEL	+12V to Coin Door board J2-2.
J141-3	BLK	Ground to Coin Door board J2-1.
J141-4	N/C	

LAMP MATRIX

Yellow (B+) — Red

Column / Row	1 Yellow-Brown J121-1 Q96	2 Yellow-Red J121-2 Q100	3 Yellow-Orange J121-3 Q95	4 Yellow-Black J121-4 Q99	5 Yellow-Green J121-5 Q94	6 Yellow-Blue J121-6 Q98	7 Yellow-Violet J121-7 Q93	8 Yellow-Gray J121-9 Q97
1 Red-Brown J125-1 Q104	RIGHT BANK TOP 11	RIGHT LOOP JACKPOT 21	TROLLS! 31	LEFT LOOP JACKPOT 41	CENTER ARROW 51	FRANCOIS D'GRIMM 61	HOWARD HURTZ 71	RIGHT OUTLANE 81
2 Red-Black J125-2 Q108	RIGHT BANK MIDDLE 12	RIGHT JOUST VICTORY! 22	EXTRA BALL 32	LEFT JOUST VICTORY! 42	BATTLE FOR THE KINGDOM 52	KING OF PAYNE 62	MAGIC SHIELD 72	RIGHT RETURN 82
3 Red-Orange J125-4 Q103	RIGHT BANK BOTTOM 13	RIGHT CLASH! 23	MERLIN'S MAGIC 33	LEFT CLASH! 43	MASTER OF TROLLS 53	EARL OF EGO 63	SIR PSYCHO 73	LEFT RETURN 83
4 Red-Yellow J125-5 Q107	RIGHT RAMP JACKPOT 14	RIGHT CHARGE! 24	TROLL MADNESS 34	LEFT CHARGE! 44	DEFENDER OF DAMSELS 54	LEFT RAMP JACKPOT 64	DUKE OF BOURBON 74	LEFT OUTLANE 84
5 Red-Green J125-6 Q102	SAVE THE DAMSEL! (2) 15	PATRON OF THE PEASANTS 25	DAMSEL MADNESS 35	CATAPULT JACKPOT 45	LEFT TOP LANE 55	REVOLTING PEASANTS! 65	CASTLE LOCK 2 75	CASTLE LOCK 3 85
6 Red-Blue J125-7 Q106	DRAGON DEATH 16	CATAPULT ACE 26	PEASANT MADNESS 36	CATAPULT SLAM! 46	RIGHT TOP LANE 56	UGLY RIOT! 66	CASTLE LOCK 1 76	SHOOT AGAIN 86
7 Red-Violet J125-8 Q101	DRAGON SNACK 17	JOUST CHAMPION 27	CATAPULT MADNESS 37	BAM! 47	LEFT TROLL TARGET 57	ANGRY MOB! 67	SUPER JACKPOT 77	LAUNCH BUTTON 87
8 Red-Gray J125-9 Q105	DRAGON BREATH 18	CASTLE CRUSHER 28	JOUST MADNESS 38	WAM! 48	RIGHT TROLL TARGET 58	RABBLE ROUSER 68	SUPER JETS (2) 78	START BUTTON 88

J1XX = Power Driver Board

SWITCH MATRIX

White — Green

Dedicated Grounded Switches	Column / Row	1 Green-Brown J206-1 U20-18	2 Green-Red J206-2 U20-17	3 Green-Orange J206-3 U20-16	4 Green-White J206-4 U20-15	5 Green-Black J206-5 U20-14	6 Green-Blue J206-6 U20-13	7 Green-Violet J206-7 U20-12	8 Green-Gray J206-9 U20-11	Flipper Grounded Switches
Orange-Brown J205-1 Left Coin Chute U17-5 D1	1 White-Brown J208-1 U18-11	LAUNCH BALL 11	SLAM TILT 21	TROUGH EJECT 31	MOAT ENTER 41	LEFT SLINGSHOT 51	LEFT RAMP ENTER 61	RIGHT BANK TOP 71	NOT USED 81	Black-Green J208-13 Lower Right Flipper E.O.S. F1
Orange-Red J205-2 Center Coin Chute U17-7 D2	2 White-Red J208-2 U18-9	CATAPULT TARGET 12	COIN DOOR CLOSED 22	TROUGH BALL 1 32	NOT USED 42	RIGHT SLINGSHOT 52	LEFT RAMP EXIT 62	RIGHT BANK MIDDLE 72	NOT USED 82	Blue-Violet J212-12 Lower Right Flipper Opto F2
Orange-Black J205-3 Right Coin Chute U17-11 D3	3 White-Orange J208-3 U18-5	START BUTTON 13	NOT USED 23	TROUGH BALL 2 33	NOT USED 43	LEFT JET BUMPER 53	RIGHT RAMP ENTER 63	RIGHT BANK BOTTOM 73	NOT USED 83	Black-Blue J208-12 Lower Left Flipper E.O.S. F3
Orange-Yellow J205-4 4th Coin Chute U17-9 D4	4 White-Yellow J208-4 U18-7	PLUMB BOB TILT 14	ALWAYS CLOSED 24	TROUGH BALL 3 34	CASTLE LOCK 44	BOTTOM JET BUMPER 54	RIGHT RAMP EXIT 64	LEFT TROLL UP 74	NOT USED 84	Blue-Gray J212-11 Lower Left Flipper Opto F4
Orange-Green J205-6 U16-9 Normal Function / Srv Crdts; Test Function / Escape D5	5 White-Green J208-5 U19-11	LEFT TROLL TARGET 15	RIGHT TROLL TARGET 25	TROUGH BALL 4 35	LEFT TROLL (UNDER PLAYFIELD) 45	RIGHT JET BUMPER 55	LEFT LOOP LOW 65	RIGHT TROLL UP 75	NOT USED 85	Black-Violet J208-11 Upper Right Flipper E.O.S. F5
Orange-Blue J205-7 U16-11 Normal Function / Volume Dn; Test Function / Down D6	6 White-Blue U208-7 U19-9	LEFT OUTLANE 16	LEFT RETURN LANE 26	LEFT POPPER 36	RIGHT TROLL (UNDER PLAYFIELD) 46	DRAW-BRIDGE UP 56	LEFT LOOP HIGH 66	NOT USED 76	NOT USED 86	Black-Yellow J212-10 Upper Right Flipper Opto F6
Orange-Violet J205-8 U16-7 Normal Function / Volume Up; Test Function / Up D7	7 White-Violet J208-8 U19-5	RIGHT RETURN LANE 17	RIGHT OUTLANE 27	CASTLE GATE 37	LEFT TOP LANE 47	DRAW-BRIDGE DOWN 57	RIGHT LOOP LOW 67	NOT USED 77	NOT USED 87	Black--Gray J208-10 Upper Left Flipper E.O.S. F7
Orange-Gray J205-9 U16-5 Normal Function / Begin Test; Test Function / Enter D8	8 White-Gray J208-9 U19-7	SHOOTER LANE 18	RIGHT EJECT 28	CATAPULT 38	RIGHT TOP LANE 48	TOWER EXIT 58	RIGHT LOOP HIGH 68	NOT USED 78	NOT USED 88	Black-Blue J212-9 Upper Left Flipper Opto F8

J2XX = CPU BOARD

= OPTO, TYPICALLY CLOSED